

Para mi querido mentor
y amigo Dr. Richard Schultes
James Wills

THE JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND

VOL. 65.

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Humphry Davy.

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Re-Numbering of the Volumes of the Journal.

IN view of the difficulties which have been experienced in giving effective references to previous Volumes of the Journal, owing to three Series of it having been issued, each with Volumes bearing the same number, it has been decided by the Council that, to avoid confusion, the Volumes of the Journal shall be re-numbered from the beginning. Thus the Volume issued in four Quarterly Parts during 1900 will in future be described as "Volume 61, 1900," the Volume for 1901 will be described as "Volume 62, 1901," the Volume for 1902 as "Volume 63, 1902," the Volume for 1903 as "Volume 64, 1903," and the present Volume as "Volume 65, 1904."

A Table showing the new numbers of each of the Volumes which have been issued since the first appearance of the Journal in 1839 is subjoined.

TABLE SHOWING THE VOLUMES OF THE JOURNAL
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NEW NUMBERS		OLD NUMBERS		NEW NUMBERS		OLD NUMBERS	
FIRST SERIES				SECOND SERIES—continued.			
Vol. 1. (1839-40)	Vol.	I. Parts I. (i.), II. (ii.), III. (iii.), and IV. (iv.)		Vol. 38. 1877 ...	Vol. XIIII. Parts I. (xxv.) and II. (xxvi.)		
" 2. 1841 ...	"	II. " 1. (v.) II. (vi.), & III. (vii.)		" 39. 1878 ...	" XIV. " I. (xxvii.) and II. (xxviii.)		
" 3. 1842 ...	"	III. " 1. (viii.), II. (ix.), & III. (x.)		" 40. 1879 ...	" XV. " I. (xxix.) and II. (xxx.)		
" 4. 1843 ...	"	IV. " 1. (xi.) and II. (xii.)		" 41. 1880 ...	" XVI. " I. (xxxi.) and II. (xxxii.)		
" 5. 1844 ...	"	V. " 1. (xiii.) and II. (xiv.)		" 42. 1881 ...	" XVII. " I. (xxxiii.) and II. (xxxiv.)		
" 6. 1845 ...	"	VI. " 1. (xv.) and II. (xvi.)		" 43. 1882 ...	" XVIII. " I. (xxxv.) and II. (xxxvi.)		
" 7. 1846 ...	"	VII. " 1. (xvii.) and II. (xviii.)		" 44. 1883 ...	" XIX. " I. (xxxvii.) & II. (xxxviii.)		
" 8. 1847 ...	"	VIII. " 1. (xix.) and II. (xx.)		" 45. 1884 ...	" XX. " I. (xxxix.) and II. (xl.)		
" 9. 1848 ...	"	IX. " 1. (xxi.) and II. (xxii.)		" 46. 1885 ...	" XXI. " I. (xli.) and II. (xlii.)		
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" 20. 1859 ...	"	XX. " 1. (xliii.) and II. (xliiv.)		" 56. 1895 ...	" VI. " 1. (21), II. (22), III. (23), and IV. (24)		
" 21. 1860 ...	"	XXI. " 1. (xlv.) and II. (xlv.)		" 57. 1896 ...	" VII. " 1. (25), II. (26), III. (27), and IV. (28)		
" 22. 1861 ...	"	XXII. " 1. (xlvii.) and II. (xlviii.)		" 58. 1897 ...	" VIII. " 1. (29), II. (30), III. (31), and IV. (32)		
" 23. 1862 ...	"	XXIII. " 1. and II. (xlix.)		" 59. 1898 ...	" IX. " 1. (33), II. (34), III. (35), and IV. (36)		
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Vol. 26. 1865 ...	Vol.	I. Parts I. (i.) and II. (ii.)		" 63. 1902 ...	Issued as a bound Volume.		
" 27. 1866 ...	"	II. " 1. (iii.) and II. (iv.)		" 64. 1903 ...	Issued as a bound Volume.		
" 28. 1867 ...	"	III. " 1. (v.) and II. (vi.)		" 65. 1904 ...	Issued as a bound Volume.		
" 29. 1868 ...	"	IV. " 1. (vii.) and II. (viii.)					
" 30. 1869 ...	"	V. " 1. (ix.) and II. (x.)					
" 31. 1870 ...	"	VI. " 1. (xi.) and II. (xii.)					
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" 33. 1872 ...	"	VIII. " 1. (xv.) and II. (xvi.)					
" 34. 1873 ...	"	IX. " 1. (xvii.) and II. (xviii.)					
" 35. 1874 ...	"	X. " 1. (xix.) and II. (xx.)					
" 36. 1875 ...	"	XI. " 1. (xxi.) and II. (xxii.)					
" 37. 1876 ...	"	XII. " 1. (xxiii.) and II. (xxiv.)					

(The numerals within brackets indicate the numbers as printed on the several Parts of each Series.)

JOURNAL
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ROYAL AGRICULTURAL SOCIETY
OF ENGLAND.

SIR HUMPHRY DAVY, BART., P.R.S.

Born December 17, 1778. Died May 29, 1829.

AGRICULTURE is the oldest of arts, while chemistry is one of the younger of the sciences. The essentials of the former have remained for many centuries practically unaltered, while the foundations of the latter are constantly shifting in accordance with the altered conditions of knowledge. The natural union of the art of husbandry with the science of chemistry has opened out a new field of progress by the help it has afforded the agriculturist in increasing the productive capability of the soil.

In May, 1802, the Board of Agriculture (established in 1793) was desirous of arranging for the delivery of lectures on "The Connection of Chemistry with Vegetable Physiology," and they were fortunate in being able to secure for this purpose the services of a young man who, although only three-and-twenty years of age, was the most brilliant lecturer of his day, and who had at this time turned his particular attention to agricultural chemistry, making it the subject of special experimental research.

This was Humphry Davy, the newly appointed Professor of Chemistry at the Royal Institution of Great Britain. Through the good offices of Sir Joseph Banks, then President of the Royal Society, arrangements were made with the

Managers of the Royal Institution by which Davy was enabled to engage himself with the Board of Agriculture to deliver a course of six lectures.

The Managers of the Institution not merely gave permission for their Professor to make arrangements with the Board, but they showed the greatest interest in the undertaking. On May 27, 1803, Sir Joseph Banks, in the name of the Committee of Science of the Royal Institution, wrote to the Board of Agriculture as follows :—

“The Committee do not expect in agricultural analysis the same degree of precise accuracy as is necessary in that intended to illustrate philosophical experiments ; it will be enough for them if the component parts of substances and their respective proportions to each other are marked with sufficient precision to demonstrate the probable effects on vegetables.

“The Committee are aware that at present the science of agricultural chemistry is in its infancy, and that till it has been more matured each analysis will take up a considerable portion of time ; they trust, however, that it will not be long before Mr. Davy himself, or some one named by him and acting under his superintendence, will undertake the business of analysing soils and manures for individuals at a moderate fixed price for each substance that shall be brought to them.

“The Royal Institution wish to have Mr. Davy’s lectures repeated at their house, and have desired me to ask whether the Board of Agriculture have any objection to a measure which appears to them likely to extend still further.”¹

The lectures delivered in 1803 gave general satisfaction, and in consequence of their success Davy was appointed Professor of Chemical Agriculture to the Board of Agriculture at a salary of 100*l.* per annum. His duties were to give lectures and to analyse such substances as were referred to him. Courses of lectures were annually delivered by Davy for ten successive years, and in 1813 the general results of his researches were published in a volume under the title of the *Elements of Agricultural Chemistry*, which passed through many editions and was translated into nearly every European language.²

Thus was founded the science of agricultural chemistry which has grown year by year and has now advanced (through the labours of many devoted workers, among whom the honoured names of Liebig, Boussingault, Lawes and Gilbert, and Voelcker stand pre-eminent) far beyond the condition in which it was left by Davy. It is the inevitable law of nature that the discoverer of one age is superseded by the worker in the next, who is able to stand upon the shoulders of his predecessors.

¹ Dr. Bence Jones, *The Royal Institution*, 1871, pp. 215, 216.

² For an account of the Board of Agriculture, 1793-1822, by Sir Ernest Clarke, Secretary of the Royal Agricultural Society (the modern equivalent of the Board) see *Journal R.A.S.E.*, Vol. 59, 1898, pp. 1-41.

The position of protagonist, however, is one that exists for all time, for the first discoverer can never be displaced from his proud position.

Humphry Davy was born at Penzance on December 17, 1778, of a good middle-class family. Although of narrow means, the members of the family had for many generations received a liberal education. Humphry's father, Robert Davy, was a wood-carver of talent, who was considered, in his own neighbourhood, as the "last of the carvers," and from his small size was called "the little carver."

When Humphry, the eldest of a family of five, was nine years old, his father succeeded to a small property at Varfell, a copyhold of seventy-nine acres on the shore of Mount's Bay, three miles from Penzance. The child was then adopted by Mr. John Tonkin, a surgeon of Penzance, who died in 1801, at the age of eighty-two. He was first placed at a preparatory school, but Mr. Bushell, the master, was so struck by the progress made by his pupil that he urged the father to remove him to a superior school. He then went to the grammar school at Penzance, where he stayed for several years; and for one year he was placed under Dr. Cardew, at the Truro Grammar School, which was reputed to be the best in the west of England. He left in December, 1793, at the age of fifteen, and his school life was completed. At school he was recognised as clever, with a precocious mind, but he was nevertheless a thorough boy and not of a particularly studious habit.

It is traditionally reported that so early was his taste for angling developed that he attempted to fish in the gutters of his native town. What, however, is of more importance in connection with his love of the sport is an anecdote communicated to Dr. Paris as to his mode of catching grey mullet off Penzance pier. "The mullet is a very difficult fish to hook, on account of the diminutive size of its mouth; but Davy adopted a plan of his own contrivance. Observing that they always swam in shoals, he attached a succession of pilehards to a string, reaching from the surface to the bottom of the sea, and while his prey were swimming around the bait, he would, by a sudden movement of the string entangle several of them on the hooks, and thus dexterously capture them."¹ In 1795 Davy was apprenticed to Mr. (afterwards Dr.) John Bingham Borlase, at first a surgeon and apothecary, but subsequently a physician of repute, at Penzance. In his hours of relaxation

¹ Paris's *Life of Davy*, 1831, Vol. 1, page 8.

Davy made chemical experiments, which often caused those he lived with to fear that he would blow up the house.¹ These appear to have taken place on the ground floor of Mr. Tonkin's house, and not in the attic as stated by Dr. Paris.

Davy possessed many endearing qualities and made friends of the best men of his neighbourhood. Among the most distinguished of these were Gregory, son of the great James Watt, Thomas Wedgwood, and Davies Gilbert, afterwards President of the Royal Society.

In 1798 Davy began his public career. Thomas Beddoes (1760-1808) at this time established at Clifton a Pneumatic Institution for the treatment of disease by inhalation. The main intention of the foundation was to make trial of different gases for the purpose of ascertaining their medicinal effects in various diseases. Beddoes was in want of an assistant in the laboratory, and Davies Gilbert recommended Davy as a suitable person for the post. Borlase liberated him from his indentures,¹ and he removed from Penzance to Clifton, where he was comfortably settled in Beddoes' house. Mrs. Beddoes (Anna, sister of Maria Edgeworth) was described by Davy as "the best and most amiable woman in the world," and in her house he formed many friendships with distinguished men, such as Coleridge, Southey, and Thomas Poole.

Beddoes was favourably impressed by Davy's account of his experiments on heat and light which Gregory Watt had given him, and he published it in *Contributions to Physical and Medical Knowledge, principally from the west of England*, which he edited. Half of the first volume of this work, published in 1799, consisted of Davy's "Essays."

At Clifton, Davy made experiments in breathing airs dangerous to life, and first discovered the virtues of nitrous oxide. He did not remain long at Clifton, and when he left, the Pneumatic Institution (for which James Watt had constructed apparatus, and Mr. Lambton (afterwards Earl of Durham) and Thomas Wedgwood supplied the principal funds, respectively 1,500*l.* and 1,000*l.*) soon ceased to exist.

In March, 1801, Davy was appointed Director of the Chemical Laboratory and Assistant Lecturer in Chemistry at the Royal Institution, on the recommendation of Dr. Hope, Professor of Chemistry at Edinburgh, who had made his acquaintance at Clifton. He was a brilliant lecturer, and the effect of his first lectures was very striking. So staid a

¹ *Davy's Fragmentary Remains*, edited by John Davy, M.D., 1858, page 19.

journal as the *Philosophical Magazine* spoke of "the sparkling intelligence of his eye and his animated manner," an expression which was so admirably caught by Sir Thomas Lawrence in that famous portrait, presented to the Royal Society by Lady Davy. Of this Dr. Paris writes: "It is one of the happiest efforts of the distinguished artist, and is the only portrait I have seen in which his features are happily animated with the expression of the poet, and whose eye is bent to pursue the flights of his imagination through unexplored regions."¹

Not long after his appointment, the Managers of the Royal Institution resolved: "That Mr. Humphry Davy, Director of the Chemical Laboratory and Assistant Lecturer in Chemistry, has, since he has been employed at the Institution, given satisfactory proofs of his talents as Lecturer.

"Resolved: That he be appointed, and in future denominated, Lecturer in Chemistry at the Royal Institution, instead of continuing to occupy the place of Assistant Lecturer, which he has hitherto filled."

The Managers decided that Davy should give a course of lectures on "The Chemical Principles of the Art of Tanning," and he was further allowed to absent himself from his ordinary duties for the purpose of acquainting himself with the practical part of the business of tanning.

He entered into this investigation with the greatest enthusiasm, and on October 26, 1802, he wrote to his friend, Davies Giddy (afterwards Gilbert), to tell him of his success: "I believe I mentioned to you in a former letter that *terra japonica* or *extractum catechu* contained a very large proportion of the tanning principle. My friend, Mr. Purkis, an excellent practical tanner, has lately tried some experiments on it in the large way. It answers very well, and I am now wearing a pair of shoes, the leather of one of which was tanned with oak bark, and that of the other with *terra japonica*, and they appear to be equally good. We are in great hopes that the East India Company will consent to the importation of this article. One pound of it goes at least as far as nine pounds of oak bark, and it could certainly be rendered in England for less than fourpence the pound; oak bark is nearly one penny per pound."²

In the following year (February 24) he read a paper before the Royal Society entitled, "Account of some Experiments and

¹ Preface to Paris's *Life of Davy*, Vol. 1, page 11.

² Paris's *Life*, Vol. 1, page 157.

Observations on the Constituent Parts of certain Astringent Vegetables and on their operation in Tanning," which was printed in the *Philosophical Transactions*.

In 1803 he was elected a Fellow of the Royal Society, from which body he received the Copley Medal, the highest honour it could confer, as well as other medals. Davy's career was now one long triumph. To the acclamations of the public were added the cordial acknowledgments of the scientific world. His Bakerian lecture before the Royal Society, on "Some Chemical Agencies of Electricity" (November, 1806), gained him the prize of the French Institute.

The sudden transportation of a youth from the provinces into the midst of the fashionable world of London, and his enthusiastic reception there, is a circumstance rare in scientific history. Davy made his mark by his first lecture; that obtained for him a position from which he never receded, but rather, improved by new triumphs in his rapid march to fame. There was a charm of manner in Humphry Davy, and an underlying power, that drew to him the best of all classes.

Dr. Thorpe points out how great was the influence exerted by Davy on the success of the Royal Institution. "The subscriptions, which in 1800 had reached 11,047*l.*, had fallen in 1802 to 2,999*l.*, whilst the expenses were annually increasing. The outlook was gloomy in the extreme, and everything seemed to portend that the latest scheme for the amelioration of humanity was about to share the too common fate of such projects. The young man of twenty-three, however, changed all this as if by the stroke of a magician's wand. No Prince Fortunatus could have done more."¹

We thus see that the Board of Agriculture obtained the services not only of the lecturer best fitted to carry out their wishes, but also one who was universally recognised as a man of mark. He whose lectures were attended by Coleridge for the purpose (as the poet himself stated) of increasing his own stock of metaphors could have been no ordinary lecturer. From his childhood he was familiar more or less with farming operations. When preparing for his lectures he appealed to a Cornishman, and in writing to Gilbert in 1802 he says: "In addition to the common course of the Institution I have to deliver a few lectures on 'Vegetable Substances,' and on 'The Connection of Chemistry with Vegetable Physiology,' before the Board of Agriculture. I have begun

¹ *Humphry Davy, Poet and Philosopher*, 1896, page 74.

some experiments on the power of soils to absorb moisture as connected with their fertility. I have for this purpose made a small collection of those of the calcareous and secondary countries, and I wish very much for some specimens from the granitic and schistose hills of Cornwall. If you could, without much trouble, cause to be procured from your estates different pieces of uncultivated soil, of about a pound weight each, I should feel much obliged to you. They should be accompanied by specimens of the stone or strata on which they lie."¹

In 1799 Davy published his "Experiments and Observations on the Silix composing the Epidermis or External Bark, and contained in other parts of certain vegetables,"² and in 1805 he made public his analysis of soils.³ In this connection a remarkable testimony to the rapidity of Davy's power of reasoning and his brilliant intuition may be quoted from his early friend, Thomas Poole, who used to say to him, "You understand me before I half understand myself." In corroboration of which Poole afterwards wrote: "I recollect on our first acquaintance, he knew but little of the practice of agriculture. I was at that time a considerable farmer, and very fond of the occupation. During his visits in those days, I was at first something like his teacher, but my pupil soon became my master both in theory and practice."⁴

Here, surely, is to be found the secret of the success of the lectures on agricultural chemistry. The energy and wholeheartedness which he put into his experiments caused such distinguished agriculturists as the Duke of Bedford, and Mr. Coke of Holkham, to help him to the utmost of their powers, and Sir Thomas Bernard to allot him a piece of ground at Roehampton for the carrying out of his agricultural experiments. The esteem and respect which he had won from agriculturists remained his through life, and he was henceforth looked upon as one of the great benefactors of mankind who had helped to improve the agriculture of the world.

In the print of the "Woburn Sheep-shearing," by George Garrard, A.R.A., published in 1811, Davy is represented as standing, in a listening attitude, behind Mr. Coke, who is

¹ Paris's *Life*, Vol. 1, pp. 158, 159.

² Nicholson's *Journal of Natural Philosophy*, &c. 4to. Vol. 3 (1800).

³ Nicholson's *Journal*, Vol. 12, 1805. A paper by Davy, "On the Analysis of Soils as connected with their Improvement," was published in Vol. IV. of the *Communications to the Board of Agriculture*, 1805, pp. 302-318.

⁴ Paris's *Life*, Vol. 1, page 145.

talking with Sir Joseph Banks, Sir John Sinclair, and Arthur Young. In 1812 his health was drunk at the Woburn Sheep-shearing by John, Duke of Bedford, and in the following year it was proposed by Lord Hardwicke.

Other bodies wished to avail themselves of Davy's remarkable powers of interpretation and did not wish them to be monopolised by the Royal Institution and the Board of Agriculture. In 1810, when lecturing in Dublin for the Dublin Society, Davy was applied to by the Farming Society for six lectures on "The Application of Chemistry to Agriculture," an offer which he accepted. He received 750*l.* for his lectures, and a large surplus went to defray expenses.

The publisher agreed to pay 1,000 guineas for the copyright of the *Elements of Agricultural Chemistry* (1813), and fifty guineas extra for each subsequent edition. The first edition was dedicated to the President and Members of the Board of Agriculture, at whose request the lectures were first published, "as a testimony of the respect of the author, and of gratitude for the attention with which they have been received."

In the fourth edition Davy wrote : "I endeavoured at all times to follow in them the progress of discovery, they therefore varied every year." Again : "It is in the farm and not in the laboratory that these [principles] can be put to the test of experiment, and my duties and pursuits have rendered it impossible to me to do more than point out the path of inquiry—to indicate the road to improvement."

In analysing Davy's lectures by the light of modern science it may be said that the first and second lectures contained little of novelty or of special scientific interest even when first published, although written in the true scientific spirit. This introduction to the subject was necessary for the information of his audience ; but it is of less value to the reader of the published work. The second lecture deals with the consideration of the general powers of matter and contains an outline of the principles of physical science especially as affecting vegetables. It has been criticised as giving too much detail relating to elements which have little or no concern with vegetation.

The third lecture is devoted to a statement of the organisation and living system of plants, of their structure, and the chemical properties of the substances which they contain. Analyses are presented of the nutritive matters contained in various substances. The work was highly praised at the time

of publication, but is now out of date. The doctrine of the circulation of sap is stated according to the theory and experiments of previous inquirers, chiefly those of Grew and Mirbel. In this lecture Davy utilised his own researches on the abundance of silicious matter in the epidermis of certain plants, a paper to which reference has already been made.

The fourth lecture, on "Soils and their Analysis," is a valuable essay, on the merits of which all critics are united. Dr. Paris describes it as the most original and valuable divisions of the work, and Professor Warington as "one of his best lectures, full of keen observation and suggestive experiment." The relations of different soils to heat and moisture are here discussed. The importance of a knowledge of the primary rocks is pointed out, but it must be remembered that geology has become a more formal science since this lecture was written. The analysis of soils was originally looked upon as the most important part of the lecture, but other classifications have since been adopted.

The fifth lecture deals with "The Influence of the Atmosphere on Vegetables," and the question whether plants in general have any material effect in purifying the air is discussed. Davy disagreed with the conclusions of Mr. D. Ellis in his researches on this subject, but an Edinburgh Reviewer argues in favour of Ellis's views.¹

The sixth and seventh lectures are devoted to the question of manures; the former with those of vegetable and animal origin, and the latter with those of mineral origin—the most important of all the branches of agricultural chemistry, but one in which knowledge has advanced so greatly that these chapters are now comparatively of little value.

The eighth and last lecture refers to "Burning Lands, Fallowing, and the Rotation of Crops." The author shows that while stiff clays are improved by burning, barren and sandy soils have sometimes been injured almost irrecoverably by burning. This concluding lecture also contains many observations of value on several agricultural operations.

The appendix on the food of animals, consisting of a series of experiments on the nutrient matter afforded by grasses, carried out at Woburn by order of the Duke of Bedford, was described in 1814 as very copious and valuable, but it was omitted from Shier's edition of the lectures (1846) as out of date.

¹ *Edinburgh Review*, Vol. 22, page 251.

Professor Warington, while somewhat critical of the book as a whole, says that "there are some paragraphs that read like the inspirations of genius, though it is now, of course, difficult to tell to what extent his statements and opinions were warranted by the facts then known. He gives a wonderfully correct idea of the action of peas or beans in rotation, even including the statement that they obtain their nitrogen from the atmosphere."¹

The book has now become an historical landmark, chiefly of interest as showing what were the beginnings of the science. The breadth of the author's views, his close reasoning, and his insistence on the value of the scientific method will ever be of interest to the student. But science does not stand still, and it is therefore difficult to estimate the knowledge of a former age and easy to forget that the commonplace of to-day was originally a discovery: consequently Davy's work has naturally ceased to be a practical guide. Davy himself, however, was the father of the science and the first to claim that agricultural chemistry was a distinct branch of science, a position which he did so much to win for it.

It has been said that the simplicity of the style of Davy's agricultural lectures was in marked contrast to that which he adopted at the Royal Institution, for he adapted himself to his audience. At the same time it must be remembered that he held strong opinions as to the introduction of a figurative and ornamental style into memoirs purely scientific. In his *Consolations in Travel*, he wrote: "In detailing the results of experiments, and in giving them to the world, the chemical philosopher should adopt the simplest style and manner; he will avoid all ornament as something injurious to his subject, and should bear in mind the saying of the first king of Great Britain, respecting a sermon which was excellent in doctrine, but over-charged with poetical allusions and figurative language, 'that the tropes and metaphors of the speaker were like the brilliant wild flowers in a field of corn, very pretty, but which did very much hurt to the corn.'"²

When, however, he left details and summed up the broad generalities of his subject, his poetical spirit asserted itself. What more unpoetical a subject can be imagined than manure? And yet he concluded his sixth lecture thus: "The doctrine of the proper application of manures from organised substances

¹ Thorpe's *Humphry Davy*, 1896, page 99.

² Paris's *Life*, Vol. 1, page 149.

offers an illustration of an important part of the economy of nature, and of the happy order in which it is arranged. The death and decay of animal substances tend to resolve organised forms into chemical constituents ; and the pernicious effluvia disengaged in the process seem to point out the propriety of burying them in the soil, where they are fitted to become the food of vegetables. The fermentation and putrefaction of organised substances in the free atmosphere are noxious processes ; beneath the surface of the ground they are salutary operations. In this case the food of plants is prepared where it can be used ; and that which would offend the senses and injure the health, if exposed, is converted by gradual processes into forms of beauty and of usefulness ; the fetid gas is rendered a constituent of the aroma of the flower, and what might be poison becomes nourishment to man and animals."

This was what was done for agriculture by Davy under the patronage of the Board of Agriculture, which was dissolved in 1822. Sixteen years afterwards (1838) the Royal Agricultural Society may be said to have arisen from its ashes to do its work on a larger scale and on a wider basis.

The Society, which has for its motto "Practice with Science," cannot but wish to have its natural association with Davy set forth—the philosopher who upheld the same principle when he wrote : "Nothing is more wanting in agriculture than experiments in which all the circumstances are minutely and scientifically detailed. This art will advance with rapidity in proportion as it becomes exact in its method."

The next great movement was set in action by Liebig. In 1840 appeared his *Chemistry in its Application to Agriculture and Physiology*, in which he "clearly traced the relations between the nutrition of plants and the composition of the soil." Mr. Rowland Prothero tells us that, in spite of views subsequently proved to be erroneous, "his book revolutionised the attitude which agriculturists had maintained towards chemistry."¹ Links continued to be added to the chain, but still there was much to be done, and the science was not sufficiently recognised.

Dr. Joseph Henry (afterwards Sir Henry) Gilbert was a pupil of Liebig's in the laboratory at Giessen. In London he had for a fellow student at University College John Bennet Lawes, and the names of these two men will ever be indissolubly united in the grateful appreciation of all Englishmen

¹ Journal R.A.S.E., Vol. 62, 1901, page 24.

for their life-long work at Rothamsted.¹ Still, in 1855, Lawes, when referring to Gilbert and the debt of gratitude due to him, could speak of the "science which has hardly a recognised existence." Now, as Dr. Voelcker writes, it has received complete acknowledgment;² and as Mr. Prothero says: "On their work has been built the modern fabric of British agriculture."³

To return to the main circumstances of Davy's life, it may be here noted that he held the office of Secretary of the Royal Society from 1807 to 1812, being associated with two very distinguished philosophers, viz.. Wollaston as Senior Secretary, and Thomas Young as Foreign Secretary.

It has already been mentioned that Davy originally had the intention of studying for the medical profession. This scheme he had given up when he took office at the Royal Institution and devoted himself to scientific research, but he does not appear to have been altogether satisfied with his financial prospects, in spite of his success, and he was for a time rather undecided as to his future. He scarcely saw at the Royal Institution a prospect of independence, and he therefore looked forward to success as a London physician. He entered his name on the boards of the University of Cambridge and kept some terms, but soon gave up this idea. He had previously declined an invitation to enter the Church. The Bishop of Durham and Sir Thomas Bernard were among those powerful friends who tried to persuade him that his eloquence might be of service in the cause of religion, and held out to him the brightest prospects of preferment.⁴

Some reason for indecision at this period of life may be found in the fact that he was a man who was bound to succeed in any walk of life he might have entered. With the feeling

¹ Mr. ALBERT PELL writes: "When I came of age I read Davy's writings with intense pleasure—his agricultural ones with enthusiasm, his fishing ones with excitement, both with wonder. It caused me pain to find Liebig and Lawes rivalling his great authority. Davy laid great stress on the value of 'humus,' *i.e.*, the fertilising properties found in the surface soil and other garden soil that had been long manipulated and nourished by the gardener. Its virtues seemed to be or were regarded as empirical, and on the whole it was thought less of when the analyst came on the field; but I remember Lawes speaking enthusiastically of its virtues, and taking me to a small patch, a portion of the garden that had been cultivated for centuries at Rothamsted, and pointing out how he had for years sown and grown red clover on it without any indications of 'sickness' showing itself."

² *Journal R.A.S.E.*, Vol. 62, 1901, pp. 351, 352.

³ *Ibid.*, page 24.

⁴ Davy's *Life of Davy* (Works, Vol. 1, page 127).

in his own mind that this was the case, he could not but be anxious as to his prospects. The future was, however, soon to take a more settled aspect in his eyes. He was knighted by the Prince Regent at a levee in 1812, and in the same year he married Mrs. Apreece, a widow of property. At this time he took the opportunity of retiring from his professorships.

In 1813, a great honour was extended to Davy by Napoleon (such as had been extended to Jenner, the introducer of vaccination). At a time when France was at war with this country Davy was allowed to travel with his party through France in order that he might examine the causes of volcanic action. The permission was not understood by the local authorities, and when the travellers landed the authenticity of their passports was questioned, the officials believing it impossible that an English party could, under any circumstances, have obtained permission to travel in France. Davy and those with him were therefore forced to remain at Morlaix for six or seven days, until the necessary instructions could be received. In due course they were set at liberty and reached Paris on October 27.

The French *savans* vied with each other in doing honour to their country's guest, and at a meeting of the Institute he was placed on the right hand of the President, who, on taking the chair, announced to the meeting that it was honoured by the presence of "le Chevalier Davy." The chemists gave him a dinner, at which were present, Gay-Lussac, Thenard, Dulong, Chevreul, Laugier, Robiquet, and Clement; and at the anniversary dinner of the Philomathic Society, on November 13, the distinguished members exhibited a remarkable instance of complacency to Davy, who was a guest. The first toast was "The Royal Society of London," for which Davy returned thanks, and proposed "The Imperial Institute." "The Linnæan Society of London" and "The Royal Society of Berlin" were given in succession, but the circumstance worthy of special note is that the company refrained from drinking the Emperor's health in consideration of the feelings of the English guest. Davy was elected a Corresponding Member of the Institute on December 13; there were forty-eight members present, and he had forty-seven votes, Guyton de Morveau being the only member who opposed the election.¹

Besides the general interest of this visit it is specially memorable for Davy's investigation on the properties and relations of iodine, a substance discovered by Courtois in this

¹ Paris's *Life*, Vol. 2, page 26.

year (1813). Its true nature being unknown, it was commonly designated as X. Ampère gave a small quantity to Davy, who at once undertook experiments, partly at his hotel and partly in Chevreul's laboratory. There were some misunderstandings on this subject, but it is not necessary to allude to them more fully here. Dr. Thorpe has stated the case very clearly and fairly in his little book.

In 1812 public attention was specially called to the urgent need of some improved system of the ventilation of mines for the protection of miners from the explosions of fire-damp by an explosion at the Brandling Main and Falling Colliery, near Gateshead-on-Tyne, which was of greater magnitude than any that had occurred up to that time. Explosions had been gradually increasing in frequency as the pits became deeper, until the fearful calamity occurred at this colliery on May 25, 1812, when ninety-two men and boys were killed. In consequence of this disaster a "Society for Preventing Accidents in Coal Mines" was formed on October 1, 1813. In the first report of the Society a letter from Mr. John Buddle, the chief authority on the ventilation of coal mines, was quoted, in which he expressed his conviction that mechanical agencies are practically powerless to prevent explosions in mines subjected to sudden bursts of fire-damp, and added that the assistance of scientific men must be looked to "for providing a cheap and effectual remedy." Many impracticable suggestions were made to the Society and a variety of air-tight or insulated lamps were proposed by Dr. Clanny, Mr. W. Brandling, Dr. Murray, and others, on a similar principle to that conceived and executed by Humboldt in 1796.¹

The Society was not satisfied with the suggestions made to them, and determined to seek Davy's assistance. Dr. Robert Gray, rector of Bishopwearmouth (and afterwards Bishop of Bristol), who was Chairman of the Committee of the Society, communicated with the great chemist, who, in answer (August 3, 1815), expressed his readiness to co-operate with the Committee, when Dr. Gray referred him to Mr. John Buddle. Specimens of fire-damp were sent to Davy early in October, by the Rev. Mr. Hodgson, and soon afterwards he

¹ See Thorpe's *Humphry Davy*, chap. 10, where the whole question of the invention of the safety-lamp is discussed. Dr. Clanny described his insulated lamp in the *Philosophical Transactions* for 1813, and in 1815 he invented a steam safety-lamp. Humboldt's lamp is described in the *Journal des Mines*, t. viii., page 839.

announced his discovery "that explosive mixtures of mine-damp will not pass through small apertures or tubes; and that if a lamp or lanthorn be made air-tight on the sides, and furnished with apertures to admit the air, it will not communicate flame to the outward atmosphere."

An account of these investigations was made public in a series of five papers in the *Philosophical Transactions* between 1815 and 1817, for which Davy was awarded the Rumford Medal of the Royal Society.

Davy made no secret of his important discovery, and refused to take out a patent for the invention of the safety-lamp, although he was urged to do so. Mr. Buddle himself stated that he was one of the friends who so urged Davy. "I felt that he did not contemplate any pecuniary reward; and in a private conversation I remonstrated with him on the subject. I said, 'You might as well have secured this invention by a patent, and received your five or ten thousand a year from it.' Davy's reply was: 'No! my good friend, I never thought of such a thing: my sole object was to serve the cause of humanity; and if I have succeeded, I am amply rewarded in the gratifying reflection of having done so.'"¹

No Government reward was awarded to Davy, but a service of plate (for which the sum of 2,500*l.* was paid) was presented to him by the coal owners of the Tyne and Wear in 1817. The following was inscribed on the centre-piece:—

"Newcastle-on-Tyne, 1817.

"This service of plate was presented
To Sir Humphry Davy by the subscribers,
As a token of gratitude for his invaluable invention
of the safety-lamp."

An old friend of Davy's, Mr. Lambton, afterwards Earl of Durham, presided on the occasion of the presentation, and in his laudatory speech he said: "You have increased the value of an important branch of productive industry; and what is of infinitely more importance, you have contributed to preserve the lives and persons of multitudes of your fellow creatures. . . . If your fame had needed anything to make it immortal, this discovery alone would have carried it down to future ages, and connected it with benefits and blessings."

Besides this present from the coal owners Davy received in 1825 a silver-gilt vase from the Emperor Alexander of Russia, accompanied by a letter from the Emperor himself,

¹ Davy's *Life*, pp. 210, 211.

expressive of his own sentiments in relation to the benefit conferred upon the whole world by this discovery.

Before the presentation from the coal owners, the following address was presented to Davy from the Whitehaven colliers:—

“ *September 18, 1816.*

“ We, the undersigned miners at the Whitehaven Collieries, belonging to the Earl of Lonsdale, return our sincere thanks to Sir Humphry Davy for his invaluable discovery of the safe lamps, which are to us life preservers; and, being the only return in our power to make, we most humbly offer this, our tribute of gratitude.”

The names of eighty-two miners are appended, the majority of them, viz., forty-seven, with their mark affixed.¹

Davy expressed to his brother his intense feeling of pleasure on receiving this. “ I was never more affected than by a written address which I received from the working colliers when I was in the North, thanking me on behalf of themselves and their families for the preservation of their lives.”²

The service of plate was bequeathed by Davy to the Royal Society after the death of his widow and brother, so that the proceeds of its sale should be used for the foundation of a medal. After the death of Dr. Davy (1868) it was forwarded to London and melted down at the Mint.³ The Davy Medal, now awarded annually, was given for the first time in 1877.

An unfortunate discussion arose over the respective merits of Davy and the subsequently famous George Stephenson, and Davy's enemies took the opportunity of traducing his character. These attacks for a time embittered Davy's life and greatly exasperated him, but the highest authorities of the kingdom fully justified him. Dr. Thorpe remarks that “ it becomes necessary to examine the grounds upon which George Stephenson—a man of undoubted genius, and of an integrity as blameless as that of Davy, and who, as the pioneer of railway enterprise, subsequently acquired a fame as high and as deserved as that of the great chemist—has claims to be regarded as an inventor of the safety-lamp.” He adds that “ an unbiassed review of the evidence will convince most people that, however certain it may be that the Killingworth

¹ Thorpe's *Humphry Davy*, page 203.

² Davy's *Life*, page 464.

³ The writer of this article may perhaps be allowed to record that when the service of plate came to London it was his duty, as an officer of the Royal Society, to take it to the Mint and receive the official acknowledgment.

engine-tenter was an independent searcher after a method of protecting a flame, it is equally certain that he was not the discoverer of the true principle on which the safety-lamp is constructed, and that the lamp associated with his name, although it bears the impress of the crude ideas with which he started, owes its real merits to the discoveries of Davy."¹

The crowning public recognition of the great merits of Davy's discovery and his generous action is to be found in the baronetcy conferred by the Prince Regent on October 20, 1818.

The reason for occupying so much space on the consideration of this invention is that Davy himself looked upon it as the greatest event of his life. In his letter to Dr. Gray, October 30, 1815, he says: "I have never received so much pleasure from the result of any of my chemical labours; for I trust the cause of humanity will gain something by it."² Dr. Davy often heard him express the satisfaction which the discovery of the safety-lamp gave him. On one occasion he said: "I value it more than anything I ever did; it was the result of a great deal of investigation and labour; but if my directions be attended to it will save the lives of thousands of poor men."³

In 1820 Davy succeeded Sir Joseph Banks as President of the Royal Society. It had been Banks's desire that Dr. Wollaston should take his place, and of Davy he said he "is a lively and talented man and a thorough chemist, but . . . he is rather too lively to fill the chair of the Royal Society with that degree of gravity which it is most becoming to assume." This is an insufficient and misleading character, such as might be expected from a worthy but heavy and unimaginative man. Dr. Thorpe justly remarks: "Oh! this gravity! 'La gravité,' says La Roehoucauld, 'est un mystère du corps, inventé pour cacher les défauts de l'esprit.'"⁴

Wollaston accepted the Presidency from the death of Banks (June 19) to the annual meeting (Nov. 30), but he refused nomination at the annual election, and Davy was elected to office with an overwhelming majority. For seven years he held the post until failing health compelled him to resign.

¹ Thorpe's *Humphry Davy*, page 206.

² *Ibid.*, page 197.

³ Davy's *Life*, page 464.

⁴ Thorpe's *Humphry Davy*, page 214.

The new President was anxious to throw new life into the action of the Society, the vitality of which had been somewhat weakened during Banks's overlong reign of forty-two years. Davy had exalted views as to the pre-eminence of the Royal Society in all scientific politics to be carried out by means of a more intimate relation with the State. Dr. Davy writes: "It was his wish to have seen the Royal Society an efficient establishment for all the great practical purposes of science, similar to the College contemplated by Lord Bacon, and sketched in his *New Atlantis*, having subordinate to it the Royal Observatory at Greenwich for Astronomy; the British Museum for Natural History in its most extensive acceptance; and a laboratory founded for chemical investigation, amply provided with all means requisite for original inquiry, and extending the boundaries and the resources of this most important national science."¹

With so wide a scheme, considering how Governments are composed, he was bound to be disappointed; but he did much, and an idea of some of the improvements he made may be gathered from the interesting series of discourses delivered at the annual meetings, which were printed in a quarto volume, and reprinted in the collected edition of his works. He was the first President to notice in his annual addresses the list of deceased fellows, and briefly describe their characters and merits in the sympathetic manner so natural to himself.

He continued the practice of taking the chair in full court dress, as seen in his portrait by Jackson, and Dr. Davy adds that he sat covered. It is not generally known that in accordance with the terms of the Statutes it is the privilege of the President to sit with his hat on. The President of the Society of Antiquaries has a similar privilege, and although this is not taken advantage of, the old cocked hat is put upon the table, and takes the place of the mace on the table of the Royal Society. This is a custom more honoured in the breach than the observance, and it may be presumed that while putting on the hat for form's sake, he took it off almost at once.

In the latter part of the year 1823, the Admiralty, having in vain attempted to obviate the evil of the corrosion and decay of the copper on the bottom of ships (which was first used in 1761), requested the advice of the President and Council of the Royal Society as to the best mode of manufacturing

¹ Davy's *Life*, pp. 271, 272.

copper sheets, or of preserving them while in use against the corrosive effects of oxidation. A Committee was appointed, and Davy himself undertook the experimental part of the inquiry, the results of which he embodied in three papers, read before the Royal Society—the first and second in 1824, and the third in 1825—which were published in the *Philosophical Transactions*. In June, 1824, H.M.S. *Comet* was, at the express request of the King of Denmark, ordered to proceed to Heligoland for fixing the longitude of that island in order to connect the Danish with the British survey. The Board of Longitude having recommended that the voyage should be extended as far as the Naze of Norway for the purpose of ascertaining also the longitude of that point, Davy applied to the Admiralty for the use of the vessel for the purpose of following up his investigations, and he obtained the entire disposal of the man-of-war after the original observations had been completed.

On June 30, 1824, Davy wrote to his brother John : “I have found a complete method of preserving the copper sheeting of ships which now readily corrodes. It is by rendering it negatively electrical. My results are of the most beautiful and unequivocal kind ; a mass of tin renders a surface of copper two hundred or three hundred times its own size sufficiently electrical to have no action on sea water.” His mode of applying his theory to practice was to affix to the copper sheets short bars of iron or zinc, properly curved to the shape of the vessels. The “protectors,” as they were called, gradually corroded, whilst the copper remained un-attacked. The principle of protection was perfect, but its very perfection caused an unexpected evil to arise, for the “protectors” allowed of the adhesion of sea-weed and shells which the scaling off prevented. The failure of the “protectors” was a source of great vexation to Davy. Immediately after the publication of his paper before the Royal Society, announcing the complete success of his plan, the Admiralty gave orders for the removal of the “protectors” on account of the fouling of the bottoms of the ships.

Dr. Thorpe writes : “Throughout the whole of this business he was exposed to a number of vexatious attacks, which greatly embittered him and reacted disastrously upon his health and character. So long as there was the hope of success and the prospect of reward, his claim to the originality of the invention was contested ; no sooner was the project abandoned than he

was assailed in the periodical press and made an object of sarcasm and censure."

The disappointment and the venomous attacks of his calumniators, following on other troubles, told upon Davy; and after this he did little work, and his life soon closed.

On May 29, 1829, Davy died at Geneva, a worn-out man, at the age of fifty-one. The nature of his complaint and the immediate cause of his death was not clear to his brother, who would have desired a post-mortem examination had not Sir Humphry felt a dread of this, "founded on an idea that it was possible for sensation to remain in the animal fibre after loss of irritability and the power of giving proof to others of existence." He therefore exacted from Dr. Davy a promise that it should not be undertaken. There does not appear to have been any particular disease, but Davy had previously had an attack of paralysis, and not being of a strong constitution, a succession of disappointments told upon a system overworked through life.

When Davy died the country lost its foremost man of science, and foreigners united with Englishmen in the expression of their regret at the world's irreparable loss. He was a man who in a most unusual manner combined the poetical with the scientific temperament. Moreover there was a charm about all he did which attracted those who came in contact with him. This charm remains for us in the record of his life and work.

It is not necessary to give an account of all Davy did for chemistry. This is well known and acknowledged at home and abroad; in fact nothing is more striking than the instant recognition of his genius by the leaders of science in foreign countries. Ampère frequently expressed his opinion that Davy was the greatest chemist that had ever appeared, and Dumas, Chevreul, and Cuvier were equally emphatic in their praise. Dr. Thorpe describes in warm terms the beauty of his investigations on chlorine, and this passage is worthy of special quotation, as it well expresses the united intuition, brilliancy, and carefulness shown in all his researches:—

"He is bold and yet wary, and as dexterous as trenchant; so confident is he in the strength of his position that he casts aside every argument that might tell in his favour, unless it is based on the most unimpeachable evidence. It is difficult to know what to admire most—the clearness of perception, the precision of the statement, the strictness of the logic,

the aptness of the illustration, or the argumentative skill with which the whole is marshalled and presented. As a piece of induction the memoir is a model of its kind, and as an exercise in 'the scientific use of the imagination' it has few equals."¹

It is necessary, however, to take account of those side issues of character which exhibit the spirit that he brought to bear upon his work. His great success in life was attained by an union of genius, brilliant talents, and friendly courtesy to all he met. This is an almost unique instance of a scientific man who stood at the head of his own special study, and at the same time was able to hold his own as the equal of some of the most brilliant literary geniuses that have ever lived.

Dr. Thorpe in his admirable life of Davy styles him "poet and philosopher." This is just, but we must take the title "poet" in its widest sense. As a writer of poetical verse he cannot be said to take a high place, although friends of such high authority as Coleridge and Southey said that, had he devoted his life to the study of the art, he would have been a great poet. He was a man who looked at the world with the insight of the poet, a quality which, combined with the power of discovery by the dry light of science, is not of frequent occurrence.

Dr. Paris and Dr. Davy both printed some pleasing specimens of Davy's verse, and the former quotes his prologue to the *Honey Moon*, produced at Drury Lane on Thursday, January 30, 1805, with the following anecdote of the chemist's remarkable versatility and promptitude: "A friend of the late Mr. Tobin called upon him at the Institution, and found him deeply engaged in the laboratory. Their conversation turned upon the *Honey Moon*, which was to be brought out on the following evening. No sooner had Davy heard that, although pressing applications had been made to several of the poets of the day, a prologue had not been written, than he instantly quitted the laboratory, and in two hours produced that which was recited on the occasion by Mr. Bartley, and printed in the first edition of the comedy."²

Southey gave evidence of his belief in Davy's poetical powers by leaving his poem of "Thalaba" with him to revise and publish when he went to Portugal.

¹ Thorpe's *Humphry Davy*, page 135.

² Paris's *Life*, Vol. 1, page 184.

Davy was a most enthusiastic angler throughout his life, and Maria Edgeworth called angling his "little madness." On one occasion he told Ticknor that he thought if he were obliged to renounce either fishing or chemistry he would find it a severe struggle to choose which to give up.

Chevreul was also a brother of the angle, and in consequence it is said that there was a closer intimacy between him and Davy than between the latter and the other French chemists. Chevreul preserved as a sacred trophy some artificial flies which he had received from Davy. Wollaston was also an enthusiastic angler, and in 1823 he made a fishing excursion into Ireland and Scotland with his friend Davy. Davy in his enforced leisure from severe illness wrote his *Salmonia*, which was published in 1828. He wished to do for fly fishing what Isaac Walton had done for bottom fishing; but it was a dangerous rivalry to set up, and the book, when contrasted with the *Compleat Angler*, cannot but stand at a great disadvantage. It is, however, of much interest as the work of Davy, and in spite of the adverse criticisms of Christopher North and others it passed through many editions. Scott wrote for the *Quarterly Review*¹ a delightful review in which he alludes to the chief beauties of the book, describing it as the production of "the most illustrious and successful investigator of inductive philosophy."

Scott writes as a follower of Walton himself, and says that, "like the honest keeper in the New Forest, when we endeavour to form an idea of Paradise we always suppose that trout stream going through it." He has some humorous allusions to the humanity of angling, and when Davy urges against the attacks of Byron on the practices of Walton and his followers that in all probability fish are less sensitive to pain than man, Scott remarks, "under the favour of such high authority this is a point which none can know but the fish himself."

Scott sings the praises of fishing for salmon, the king of fish, and glorifies the pursuit. In analysing Davy's book he gives a delightful description of the distinction between the adept and the tyro. The angler for salmon, like the poet, is born and not made, and "no degree of zealous study will supply the want of natural parts."

Scott draws a charming comparison between Walton and Davy, and quotes a beautiful picture from *Salmonia* in which

¹ Vol. 38 (1828).

“the angler seems to contemplate nature with the eye at once of a poet and a philosopher.”¹

The testimonies to the beauty of Davy's character are numerous, and, written as they are by lifelong friends, they carry great weight. Southey called Davy “an irreplaceable companion”; and Thomas Poole wrote to Dr. Davy: “Although the most friendly intercourse existed between us for thirty years, and occasionally correspondence by letters, I fear I have little else to communicate than to bear testimony to his general intellectual elevation, and to the warmth, sincerity, and simplicity of his heart. . . . Neither the importance of his discoveries, nor the attentions of the exalted in rank and science, whether as individuals or public bodies, nor the honour conferred on him by his sovereign, made the least alteration in his demeanour or in the tone of his correspondence. No man was ever less spoiled by the world. The truth is, though he conformed to the world and paid due deference to those men and things which are deferred to by the world, his delight was in his intellectual being.”

Wordsworth said that it would be difficult to express the feelings with which he, who so often had climbed Helvellyn alone, found himself standing on its summit with two such men as Scott and Davy. The intimate friendship of Coleridge and Davy is well known. Those strangers who came in contact with him were struck by his unaffected charm; and so natural was he in his manners that often they were quite unaware that they were in the presence of a man of world-wide fame. Those who met him as anglers were surprised to learn afterwards that they had been on such intimate terms with the President of the Royal Society. Mr. Samuel Purkis, who made a tour through Wales with Davy in 1802, gave to Dr. Paris an amusing account of their meeting with an agreeable stranger at the little inn at Tan-y-Bwlch:—

“Davy's youth, simplicity of manner, and cautious concealment of superior knowledge, not exciting constraint, our

¹ The writer has had the privilege of consulting an interesting collection of four small volumes of Davy's MS. note books, dated respectively 1804, 1827, 1828, and 1829, in the possession of his friend, Mr. Arthur Gilbey, who kindly lent them to him. The volume for 1804 contains jottings of thoughts as they occurred to Davy, hints for poems, &c., and these have evidently been used by Dr. Davy, as he prints some of the aphorisms in his *Life*. The volume for 1827 contains a Fishing Journal, and Hints and Experiments in Physical Science; that for 1828, Notes on the Torpedo, &c., Additions to the Second Edition of *Salmonia*, written in Southern Austria; and that for 1829, Further Notes for *Salmonia*, written in Rome.

companion was naturally induced to deliver his opinions with the utmost freedom and confidence on all subjects. We commenced on poetry and painting—the sublime and beautiful ; then proceeded to mineralogy, astronomy, &c., and occasionally on topics of mirth and humour, so that the evening was passed with general satisfaction. When Davy retired to rest and I was left alone with our companion, I inquired how he liked my friend, and whether he considered him a proficient in science, and versed in chemistry and geology ? He answered, coolly, that he appeared to be rather a clever young man, with some general scientific knowledge. He then asked his name, and when I announced, ‘Davy, of the Royal Institution,’ the stranger seemed thunderstruck, and exclaimed, ‘Good God ! was that really Davy ? How have I exposed my ignorance and presumption !’ ”¹

Dr. Paris, while praising Davy highly, rather severely censures the coolness of his manners towards his French friends on his visit to France. A poor return for their warm reception of him, and he attributes this to *mauvaise honte*. This is likely to create a very erroneous idea of Davy’s manners. De Quincey, who met him at Coleridge’s, gives a very different description, and probably a truer one than that of Dr. Paris. He writes : “Of all the eminent persons whom I have ever seen, even by a casual glimpse, [he] was the most agreeable to know on the terms of a slight acquaintance.” And again : “But what chiefly distinguished him from other men was the captivating—one might call it the *radiant*—courtesy of his manner. It was at once animated and chastised by good breeding : graceful, and at the same time gracious.”

The most remarkable testimony of all is to be found in Lockhart’s *Life of Scott*, (chap. 49) where Davy is seen outside his own domain of science in friendly competition with Scott for conversational honours : “I have seen Sir Humphry in many places, and in company of many different descriptions, but never to such advantage as at Abbotsford. His host and he delighted in each other, and the modesty of their mutual admiration was a memorable spectacle. Davy was by nature a poet ; and Scott, though anything but a philosopher in the modern sense of that term, might, I think it very likely, have pursued the study of physical science with zeal and success, had he happened to fall in with such an instructor as Sir Humphry would have been to him, in his early life. Each

¹ Paris’s *Life*, Vol. 1, pp. 155, 156.

strove to make the other talk, and they did so in turn more charmingly than I have ever heard either on any other occasion whatsoever. Scott, in his romantic narratives, touched a deeper chord of feeling than usual, when he had such a listener as Davy; and Davy, when induced to open his views upon any question of scientific interest in Scott's presence, did so with a degree of clear energetic eloquence, and with a flow of imagery and illustration, of which neither his habitual tone of table talk (least of all in London), nor any of his prose writings (except, indeed, the posthumous *Consolations in Travel*), could suggest an adequate notion. I say his prose writings—for who that has read his sublime quatrains on the doctrine of Spinoza can doubt that he might have united, if he had pleased, in some great didactic poem, the vigorous ratiocination of Dryden, and the moral majesty of Wordsworth? I remember William Laidlaw whispering to me one night, when their 'rapt talk' had kept the circle round the fire until long after the usual bed-time of Abbotsford—'Gude preserve us! This is a very superior occasion! Eh, sirs!' he added, cocking his eye like a bird, 'I wonder if Shakespeare and Bacon ever met to screw ilk other up?'"

It would be impossible for any words to surpass these, as showing the remarkable character and powers of Davy, more especially as they come from one who was most capable of expressing an opinion.

It will ever be a source of pride to agriculturists that Davy turned aside for a time from his more special studies, and gathered the results of his own researches and the labours of his predecessors into a systematic treatise, thus inaugurating a movement which has increased day by day in practical value, and caused to be sown seeds which have grown so luxuriantly that the original plant has been obscured.

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PRACTICAL HINTS ON FRUIT FARMING.¹

INTRODUCTION.

FRUIT growing is a most interesting and engrossing occupation, and taking an average of seasons is also profitable if it is conducted in a businesslike and intelligent manner. It happens occasionally, however, as in 1903, that the fruit crops are most seriously injured by the weather, by spring frosts, by abnormal cold and wet, and by hail. Again there are seasons with a superabundance of fruit when the markets are glutted and some of the more common kinds as damsons, low-class plums, and gooseberries, do not pay for picking. This happened in 1898, when many damsons were left on the trees as they were not worth the cost of picking. In 1903, on the other hand, damsons made from 20s. to 25s. per cwt. Upon the whole, there is a good profit from fruit growing, as is shown by the steady increase in the acreage. One great objection to its adoption by tenant-farmers was that so much time must elapse before any return could be made. This has been removed in a great degree by the introduction of trees of dwarf and quick-fruited habit, in the shape of half-standards, pyramids, and bushes of apples, pears, and plums. Tenants are also now protected by recent legislation which ensures compensation for reasonable outlay, and landlords are generally most willing to sanction and encourage such improvement to their property and to assist their tenants by providing trees and in other ways.

The acreage of fruit land has considerably increased in the last thirty years; in 1872 there were 169,808 acres in Great Britain; in 1892 there were 208,950 acres of orchard land, and in 1904 this amounted to 243,008 acres. In 1904 there were also 77,952 acres of land planted with small fruit, gooseberries, currants, raspberries, and strawberries, as against 65,845 acres in 1893.

It has been prophesied for some years that the British fruit grower cannot hold his own against foreign rivals living in sunnier and less capricious climes. Although the

¹ Copies of this article in pamphlet form are available for distribution. Price 1s. per copy through any bookseller, or 6d. per copy on direct application to the Society by Members.

importation of fruit has increased enormously, the acreage of fruit land in this country has steadily extended. The annual average quantity of apples imported into this country from 1882 to 1892 was 2,000,000 bushels. The annual average quantity of apples imported from 1893 to 1899 inclusive was 4,201,107 bushels. From 1900 apples were computed by cwt. instead of bushels, and estimating each cwt. as two bushels, the annual average importation of apples in 1900, 1901, 1902 and 1903 works out at 5,685,342 bushels. The value of the apples imported in 1903 is given as 2,781,348*l*. In 1903 the importation of fruit of all kinds, excepting bananas, amounted to 5,689,645 cwt., of the value of 4,086,242*l*. In spite of the large importation of fruit the price of apples, pears, plums, damsons, gooseberries, currants, and raspberries was very high in 1903 as the yield was small. Most of these fruits made almost record prices.

There is always a great demand for good specimens of the finer varieties of apples, pears, and plums having colour and flavour, and some of the growers use every endeavour to supply fruit of this kind. In the best apples, pears, and plums grown in this country there is a flavour which is not present in the very best foreign fruit. It is true that some of the American and Canadian apples, for example, possess fine qualities, but they cannot equal those of the Cox's Orange Pippin, to take one instance. If growers will cultivate the best kinds of fruit with skill and energy and have it picked carefully and systematically graded for market, and packed well, they need not be afraid of the foreign producer. For the "small fruit"—currants, gooseberries, raspberries, and strawberries—there is always an enormous demand for eating and for jam-making from all classes of the community, which will increase as long as the price of sugar remains cheap. A high duty on sugar would seriously cripple jam manufacturers and benefit foreign makers, who at present are completely handicapped, if they are not altogether out of the running, by taxed sugar. Dear sugar would also materially injure British fruit growers.

METHODS OF PRESERVATION AND DISTRIBUTION.

This demand for jams, jellies, preserves, and other fruit confections, which are produced at a small comparative cost in Great Britain, has caused but little attention to be paid to other modes of preserving fruit adopted in countries

where sugar is dear. The chief of these is the Evaporation of Fruit, which is a most important and profitable industry in the United States. It was described by the late Mr. Dan Pidgeon in an interesting paper, entitled *Fruit Evaporation in America*¹, explaining the details of this method of treating fruit in the United States, and showing the extent of the industry and its enormous increase in recent years. As the term implies, the evaporation of fruit is simply the driving out of the watery parts by heat, thus reducing the bulk and weight, and making the fruit portable on account of its dryness, and available for use at any time. The process is mainly applied to apples, pears, and peaches, as well as to vegetables of many kinds. Attempts have been made to introduce evaporation into this country as a means of disposing of surplus fruits and vegetables, especially in seasons of superabundance, but so far there has been but little action on the part of producers and fruit growers in this direction. Evaporating machines, suitable for large or small producers and preservers, as used in America, have been exhibited, and trials have been made of them at some of the Royal Agricultural Society's Meetings, and at several local shows. The trials proved that the work was satisfactory, and as a further proof one has only to inspect the apple and peach quarters, "rings," and "chips" on sale in the grocers' shops in this country, which are evaporated by these machines and imported from the United States and Canada. As giving some idea of the growth and present importance of the industry in foreign countries, it may be stated that, in 1902, 654,170 cwt. of fruit preserved without sugar were imported into this country, as against 396,130 cwt. in 1890.

But this method of disposing of fruit has not been utilised to any extent by British growers, or fruit preservers, who, as stated above, prefer to make jam, and who will continue to do so while sugar is cheap. In seasons when the fruit crops are abundant, and there is difficulty in selling fruit at remunerative prices, some growers merely boil it without sugar, and put it into hermetically sealed vessels, in which it will keep for a long time. It is called "pulp," and can be made into jam by the addition of sugar whenever there is a demand for it. Jam makers also "pulp" fruit when it is very cheap, and make it into jam when it is required.

¹ Journal R.A.S.E., Vol. 49, 1888, pp. 487-492.

There is yet another mode of treating fruit in the United States and Canada even more important than evaporation. This is the preserving of the fruit in tin cans and glass jars, and is termed "canning." Fruit treated in this way will keep for long periods, as the air is exhausted and all germs of fermentation are excluded; much or little sugar may be used or none at all. Canning might be adopted in Great Britain with much advantage, both by the producers themselves, and by the establishment of factories to which fruit could be consigned; so that surplus fruit might be utilised and the panic prices occasionally ruling in fruitful seasons avoided. But canning, like evaporation, though they would both be most valuable aids in the disposition of fruit, has not found favour with British growers or buyers.

A canning factory is furnished with most ingenious apparatus for paring, coring, and stoning fruit, and is also provided with large tanks, heated by steam, for boiling the fruit. Apples, pears, and peaches are pared, cored, and then washed in troughs. The fruit is crammed into cans or glass jars as tightly as possible. Plums are rapidly stoned by machinery and pressed into cans or glass jars. The cans or glasses are labelled to show the kind of fruit in them and are arranged in racks holding many dozens, placed upon trucks, and carried to a tank of syrup from which each can or glass is filled up. Caps or metal coverings are then soldered on by means of a clever machine, which works most rapidly. A small hole is left in the centre of each cap, which is so small that no water or syrup can get in. The truck with the cans is moved to a tank containing boiling water in which the racks of cans or glasses, lifted from the trucks, are placed and kept for spaces of time varying with the kind of fruit. After this boiling the holes in the caps are soldered up. Again the cans are put into boiling water for a few minutes to destroy any germs that might set up fermentation.

Glass jars are used in preserving fruit and vegetables in the United States and Canada to a considerable extent, as they have many advantages over cans, which are supposed to communicate unpleasant flavour and unwholesome quality in some degree. The glass jars used in the United States are shown by the Figures A and B given here, having metal lids which are screwed on. They are termed "Lightning" and "Mason" respectively, and range in capacity from one pint to two quarts.

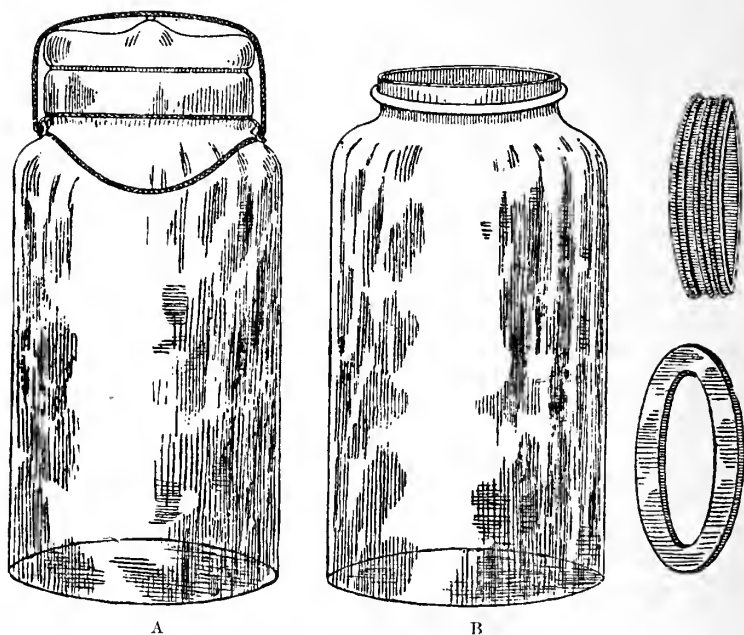


FIG. 1.—Glass Jars for Canning with Metal Top and Rubber.

Although comparatively little use has hitherto been made by British growers of the processes of evaporating and of canning surplus fruit, they have, in a few cases, been adopted in jam factories. Unfortunately, these are not so numerous as they were, and are not so flourishing as they ought to be. There is a want of communication between them and the growers. Most of the fruit for jam-making is bought in the markets, and is not obtained direct from the producers, many of whom seem to prefer the old-fashioned practice of consigning it to a London market in perfect ignorance as to the conditions of supply and demand. As in some other products of the land the producers are seriously affected by imperfect and inadequate means of distribution, and of reaching customers who are on their part only too anxious to be supplied. Fruit, for instance, is not obtainable in many households, or is only obtainable at prohibitive prices, although, at the same time, in the centres of production it may be hardly worth picking, and in the centres of sale—the large markets—much fruit may be unsaleable because of its superabundance. Some improvement in modes of distribution has taken place, however, in recent years. Growers have put themselves more in touch by telegraph and

telephone with large markets in the Midlands and other districts, and in Scotland, and in a few cases have started motor vans to enable them to send off fruit at once on receipt of telegrams—without the delay consequent upon transmission by rail—to any market within a considerable radius. By this means all delay in delivery is obviated and there is no shifting of the fruit from rail to delivery carts. The fruit is run direct into the markets. Better distribution is much to be desired to enable British growers to compete advantageously with imported fruit.

Distribution is naturally affected by the methods as the profit of fruit growing is by the cost of conveyance. Some of the English railway companies are now doing all they can to improve the distribution of fruit by fixing reduced rates for carrying fruit by passenger trains in lots of 5 cwt. and upwards, and have promised to give better services for fruit to towns of moderate size, and to seaside resorts. Reduced rates for the conveyance of fruit by goods trains, in quantities exceeding one ton, and the provision of more rapid delivery between the termini and the markets are under consideration by several leading railway companies, who have already ordered many improved vans with special ventilation.

Fruit growers must continuously urge the railway companies to give them the best, most frequent, and quickest conveyance and delivery of their goods at the cheapest possible rate, and to open up communication with every likely centre of sale. There seems a general disposition on the part of railway companies to grant better facilities to producers now that public opinion so strongly urges this, and the competition of motor vans may be serious to railway companies if they do not afford the best possible service.

NEW ORCHARDS AND PLANTATIONS.

Soils.—There is not only a difference in the soils of each county in Great Britain, and in every division of each county; but there is also a diversity on every farm and even in every field. In this respect the fruit grower is confronted with the same problems and difficulties as the ordinary husbandman. There are, as with other crops, certain soils peculiarly adapted to and fitted for fruit culture in general, and to certain varieties in particular; but it is claimed that a vast extent of land outside these favoured tracts of soil will grow fruit, and grow it with a profit, provided skilled management and

treatment are brought to bear upon it. Land that will produce a fair crop of wheat may reasonably be expected to grow fruit of some variety. Loamy marls, clays, sandy and calcareous loams, and alluvial soils may be regarded as eminently suitable for the production of fruit, while heavy clays and light lands can be so ameliorated and amended that they may be rendered qualified for this purpose. These operations are well known to the agriculturist and are satisfactorily carried out in other branches of tillage. Provided that there is a sufficient depth of soil, with a naturally or artificially drained subsoil, most fruits will succeed if judiciously managed. Naturally drained and porous subsoils are undoubtedly preferable and produce the best results, and the expense of draining is also considerable. Fruit trees will not flourish on land which is waterlogged or sodden in the slightest degree, although some kinds—notably the plum and the black currant—will withstand excess of moisture better than other fruits. The cherry, perhaps, is more fastidious as to its surroundings than any other fruit.

Situation.—The remarks upon soils may be equally applied to situation. Though a gentle incline to the south or southwest is an ideal position, this combination is not readily met with, and at the same time is not actually essential. A traveller journeying through the fruit growing districts will find orchards and plantations placed at all points of the compass, and those lying towards a so-called unfavourable quarter appear often as thriving as others planted in one seemingly more satisfactory. The great point in raising fruit plantations is to avoid elevated land prone to cold and cutting winds, and at the same time to shun low-lying situations which are subject to frosts and fogs, especially if they are adjacent to water. The golden mean between these alternatives is the situation to be aimed at. Frosts and cold winds are, in reality, the greatest foes to the fruit grower, and the finest fruits are grown in the southern and western counties, for the reason that in these districts they are not so frequent and severe.

Knowledge, scientific and practical, and care, as for instance, in the choice of suitable varieties, as to correct pruning, and good cultivation, are the main factors, and an untoward soil and situation may be rendered amenable by judicious and skilful management. Shelters from high winds may be formed in exposed positions by planting quick growing firs

or larches, and even deciduous trees such as poplars. Orchards and plantations are frequently surrounded with damsons and certain kinds of robust growing plums, planted thickly as a screen against the winds.

Planting.—Before raising an orchard or plantation the grower should discover, either by observation or from the past experience of himself or others, what varieties of trees are suitable to his soil, locality, and market. A reliable nurseryman may be consulted with advantage. In buying fruit trees it is advisable to avoid specimens covered with fruit buds and yet with a minimum of growing wood; these trees have in many cases been lifted in order to produce fruit spurs, and thereby catch the customer's eye, but in reality this apparent fruitfulness has robbed the tree of its vigour, and it will be a long time before it recovers from this forcing treatment and in some instances it will not recover from it. It is therefore not desirable to purchase trees which have been lifted at least during the preceding three years and even then when only showing good growth. This does not apply so much to trees for gardens or enclosed spaces as to trees intended for field or market work. The distances for setting out trees may be found in most nurserymen's catalogues. It is sometimes a good plan, according to the nature of the soil, to place the trees nearer together than is usually recommended. Thus free-growing apple trees, which take some years to produce a yield, may be planted at the usual distance, but the short-growing, and therefore, varieties which give a quick return may be planted closer. One method which is practical and feasible is to plant these latter between the former. For example, the free-growing Newton Wonder may be planted 24 ft. apart with some short-growing kind, such as Lord Suffield or Worcester Pearmain, placed between them.

Fruit trees to succeed to the greatest advantage should be planted upon arable land and not direct on to grass. The ground around standard trees should be cultivated from six to eight years or even more, according to the vigour of the trees and the quality of the land. When they have obtained a good hold and have made fair trees, the land may be laid down. Experience has shown that young fruit trees planted directly upon grass land, either for a new orchard or to fill up vacant places in old orchards, do not thrive nearly so well as trees in cultivated soil. Grass round young trees absorbs the nutrition from the area covered by their roots just below the surface and checks their growth. Grass also, by its

evaporating power, exhausts the moisture from the soil, so that the roots of the young trees do not get anything like a proper supply. The evaporation from turfed soil has been proved by experiments made at the Woburn Experimental Fruit Farm to be three or four times that from cultivated ground.¹ In dry seasons the effect upon young trees would naturally be most disastrous. One constantly sees young trees, planted in grass orchards with grass close around them, stunted, starved-looking, and often dying. When fruit trees are put in to fill up blanks in established orchards, spaces of at least from 2 ft. to 3 ft. should be left free from herbage round the young trees for some years. Weeds must not be allowed to collect, as, though their action is not nearly so deadly as that of grass, they rob the trees of nutrition and moisture. In the Second Report of the Woburn Experimental Fruit Farm for 1900, the practice of letting grass grow round young trees is strongly condemned, and the results of careful experiments show that not only are the growth and vigour of the trees seriously impaired, but the colour and quality of the fruit are materially damaged, and this is even more strongly emphasised in the Third Report for 1903. Bush fruits, as currants, gooseberries, strawberries, and raspberries are grown on cultivated land; and cob-nuts—as the cob-nut tree is a long liver—are usually placed beneath standard trees under cultivation. Trees on the Paradise or dwarf stocks should always remain under cultivation.

The land intended for the trees should be steam ploughed and the subsoil plough employed where necessary. Trenching is too expensive an item on a large area. The holes for the standard or pyramid trees should be dug out 6 ft. in circumference, the depth being guided by the subsoil. If the subsoil is kindly working it may be chopped up with the top soil, but if it is harsh and unkindly it is better left alone. On heavy clays a compost of road sidings may be added with advantage. The tree should be planted firmly but not too deeply. In the case of wet soils it may be placed on a slight mound. Two stakes must be placed to the tree joined by a hay or straw band, care being taken to have the ligature high up the stem to prevent the top being snapped off by rough winds. These stakes, if renewed, should be driven into the old positions, as, if their situation is altered, they may bruise or pierce some of the roots, and the ligatures should be frequently examined to see if

¹ See Note on "The Effect of Grass on Apple Trees," by Spencer U. Pickering, M.A., F.R.S., *Journal R.A.S.E.*, Vol. 64, 1903, pp. 365-376.

they are cutting the trees. Each variety of tree should be placed in separate rows, not only for facility in picking, but because some kinds require to be pruned before others, and also sprayed to rid them of insects or fungi. A few varieties of choice kinds are preferable to a medley of inferior sorts. The cultivation consists in digging the land with a three-pronged spud—a spade must never be employed—and after this operation frequent stirrings and hoeings are given throughout the season. The cost of planting depends on the locality and the nature of the soil chiefly, but a rough estimate for a plantation of apples with bush fruit below would be from 25*l.* to 30*l.* an acre, and the annual cultivation and marketing after the plantation is established from 15*l.* to 17*l.* per acre. If pyramids are substituted for standards the cost would be greater by from 10*l.* to 20*l.* Orchards planted direct on grass would cost from 14*l.* to 18*l.* an acre. An acre of raspberries would cost from 14*l.* to 15*l.*; of strawberries, 8*l.* to 10*l.*; of red currants, 9*l.*; and black currants, 12*l.* per acre, exclusive of manure in each case. Standard trees if planted early may be pruned the same season, but if the planting has been delayed they are better left uncut till the following autumn. The pruning of trees will be treated of later on.

Manuring.—The staple manure amongst fruit growers is dung, as with other farmers. This is dug in at the rate of fifteen to twenty-five loads to the acre. Manure from stables and cowhouses from large towns is largely used. The refuse from factories, such as shoddies, fur waste, leather dust, cartridge paper, is also employed, together with fish.

Peruvian and fish guanos are favourite manures for bush trees and strawberries. Soot is also in great requisition for the latter. Lime is beneficial where its presence is wanting in the soil. Before using artificial manures to any great extent it is advisable to obtain an analysis of the soil and to manure accordingly, so that such manures as superphosphate, potash, nitrate of soda, and kainit may not be unconsciously wasted. The fruit grower's manure bill is a heavy item, often amounting to 8*l.* or more per acre, and great circumspection should be used in applying stimulants, especially in the case of artificial manures.

RENOVATION OF OLD ORCHARDS AND PLANTATIONS.

The renovation of old and neglected orchards and plantations is scarcely less important than the proper and primary

management and cultivation of new ones. There are, unfortunately, scattered throughout the country many orchards and plantations which are not only an eyesore, but a disgrace—mere masses of wood and branches more fitted for a forest tree than a fruit tree. Nevertheless these trees, however unsightly and unprofitable, may in many instances, with due attention and patience, be brought into a fairly uniform and remunerative condition. It is a great mistake at the first onset to use the mattock in a wholesale fashion, or indeed on individual trees, until a fair trial has been given; after that, if the result is unsatisfactory, the trees may be grubbed and a beginning made elsewhere. The first measure carried out by the possessor of such a holding should be to cut out and thin the tree of all crossing, misshapen, decaying, and decayed wood; this treatment should be performed gradually, and should be extended over a few seasons. The operation is salutary in promoting the formation of new wood, and letting in air and light, thereby encouraging the increased production of fruit buds. The trees should be scraped with scrapers of blunt flat iron in the autumn, which not only take off the rough epidermis and open the pores of the wood, but also destroy innumerable insect pests, together with lichenous and mossy growths. Lime thrown up on to the limbs and branches on foggy mornings will also materially conduce to the demolition of cryptogams and insects.

Another difficulty also confronts the grower in the improvement of such orchards. Some trees must be removed owing to decay or other reasons. To plant a tree where another has lived for years and drained the surrounding soil of its nutriment is a critical proceeding; but in order to preserve the symmetry of the holding, and to fill up an otherwise blank and waste space, the difficulty must be faced. The holes should be dug out similarly as in new orchards, and all the turf chopped up in the hole. If plums are planted young trees of the robust and free growing kinds should be selected; such as Pond's Seedling, The Czar, Cox's Emperor, and Rivers's Monarch.

If apples are planted the sorts having the same characteristics should be chosen. The best of these are Gascoigne's Scarlet Seedling, Bramley's Seedling, Peasgood's Nonsuch, Newton Wonder, Allington Pippin, and Byford Wonder. These will also afford excellent grafts for old trees, together with Stone's apple—an admirable variety for such usage—and Worcester Pearmain. Plums invariably succeed better than

apples when planted under these conditions, and should be grown in preference; but it will be found necessary in some circumstances to fill up with apples, as a few plums put here and there in extensive orchards cause much extra trouble at picking time. An important fact to be remembered is that in consequence of the soil having been occupied for many years by a tree, it is naturally poor and lacking in fertility; so that frequent mulchings of manure must be given in order that the tree may find immediate and direct sustenance and so obtain a rapid hold and make wood freely. Rotten dung, turf, and road sidings, may be in this case mixed together in the hole, and the tree may be planted in this compound. Road sidings and scrapings, however, should not be used too freely on light land, as they draw away the moisture, especially in hot seasons. Another point, which is frequently overlooked, is the cultivation of the land round the trees by hoeing and stirring for some years, at a distance of 4 ft. to 5 ft. until the tree has obtained a fair growth. It is a good plan to increase this circumference with the growth of the tree. If this practice is not carried out, the grasses and weeds will draw all the nutriment from the ground properly belonging to the tree, and will also exclude air, light, and moisture; in fact the tree will be practically starved. If any reader is in doubt about this statement it would be interesting to him to test two trees grown under the different systems. When the tree has obtained a strong growth grass seeds may be sown.

Old orchards should be liberally mulched with farmyard manure spread round the trees at a distance of 3 ft. from the bole, so that the roots may feed on and benefit by the application. Orchards under grass should never be mown, but stock should be fed lavishly with cake and corn beneath the trees. The young trees should be protected by guards or cradles, as cattle bite off the tender shoots, and sheep, especially in hard weather, gnaw and lacerate the stems. Hares and rabbits also commit great havoc if allowed ingress into orchards or plantations. Protection from horses, cattle, sheep, and rabbits is most essential. Not half enough attention is paid to this and to other details. If a tree is barked by animals in the least degree, it generally cankers and becomes unhealthy. Where no cattle and horses are grazed, cages of galvanised wire of a fine mesh put close round the trees, about 5 ft. high and 8 in. in diameter, will, at a very small cost, serve to keep off sheep and rabbits. A fence against cattle and horses may be made by driving split

fence rails cut into "slats" or lengths of 8 ft., and 1½ in. to 2 in. in thickness and width, into the ground, and fastening them at the top with braces. The ends of the uprights should be creosoted, as all posts and parts of fencing that go into the ground upon farms should be, and with care they will last pretty well until the tree is out of danger. The trees also require to be protected against rabbits by cages of galvanised wire netting. The best and most effectual method of protection is to wire the orchard all round taking care to sink the wire deeply, and yet to place it high enough to prevent the animals from jumping over. Where wire is deemed too costly, the trees are often smeared with compounds obnoxious to these pests. It is practically essential to wire plantations containing bush trees, as their branches and shoots are so close to the ground that they fall an easy prey to hares and rabbits.

Poultry are an admirable acquisition to grass orchards. If placed in portable houses and moved occasionally, so as not to taint the land for stock, they not only bring in a revenue but also consume quantities of insects. The crop of a hen examined in the autumn revealed the bodies of forty wingless females of the winter moth. Their avidity for earwigs and weevils is remarkable, and in their roamings they destroy and consume myriads of the numerous foes which assail fruit trees and bushes. Pigs fed under orchards, if allowed to root, not only manure the trees but also improve the pasture. They should be penned in a small area at a time, and peas or maize may be thrown over the grass, which is afterwards harrowed or rolled, and fresh seed sown if necessary. Grass, as is well known, was never the worse for rough usage, and a beautiful sward is the result of this practice. In cold or rough weather shelters may be erected for the pigs. Bees undoubtedly fertilise the blossoms and should be encouraged. Some think that they injure the bloom by nipping out the calyx to obtain the honey with greater facility, but an observer will note that this injury is due to birds. It has been remarked that where bees are kept the trees surrounding the hives bear fruit of better quality and heavier in weight, but this assertion requires further inquiry and observation.

CULTIVATION OF SPECIFIC FRUITS.

Apples.—The Apple is the most useful fruit of commerce, and always meets with a large demand for dessert and culinary purposes. Unlike most fruits it can be used nearly throughout

the whole of the year, and for this reason is an established favourite with the public. Standard apples, and bush trees of some kinds, are raised on the crab stock owing to its hardy constitution. Apples, however, may be grown on stocks of other apples, but it is inadvisable to raise trees from pips obtained from the mash of cider factories as failure often results, and it is therefore a better plan to work on the crab. Some kinds of apple trees, such as Annie Elizabeth, if they are procurable in any number, make excellent stocks for other varieties.

Bush trees are for the most part grown on the English Paradise stock, grafted close to the ground. The French Paradise should be carefully avoided as it is of too dwarfing a nature.

The apple does not flourish on very shallow soils, nor will it succeed on wet or water-logged land; otherwise it can be grown on most various soils intermediate between these two extremes. Even in the north examples are shown which equal in quality and colour fruit grown in the west and south.

Varieties of Apples.—The varieties of apples are numerous, but it is advisable to grow only a few kinds of the best quality, unless any certain kind of apple has a local reputation, or succeeds well in the neighbourhood. Most apples, with a few exceptions, will succeed equally in the north as in the south, and in looking over lists of apples grown in the two extremes of climate there appears a remarkable similarity in the sorts grown, which is, without doubt, owing to their superior quality and the demand that arises for them. Mr. Gladstone and Red June-eating are good kinds for early work among dessert varieties, followed by Devonshire Quarrenden, which, however, is a shy bearer in some localities; Worcester Pearmain, the most popular mid-season variety, whose colour is most attractive, crops heavily and in a short space of time; Summer Golden Pippin is a favourite market sort; Wealthy is an apple that deserves further recognition; Gascoigne's Scarlet Seedling is an ornamental kind; Beauty of Kent is another fine sort that is somewhat neglected; King of the Pippins, and Adam's Pearmain are good sorts; and Blenheim Orange, although the tree is slow in bearing, eventually pays well for planting. Cox's Orange Pippin is the finest dessert apple, but it does not succeed on badly drained or heavy clay land, where that valuable and more robust apple, Allington Pippin, thrives better. Roundway's Magnum Bonum is an apple of superior

character vieing with the choicest dessert kinds, and it should be more planted. In the north, Allington Pippin or Charles Ross may be planted in the place of Cox's Orange Pippin. Irish Peach, Golden Russet, Kerry Pippin, and Court Pendu Plât, may also be added. The best sorts of culinary apples are Lord Suffield, which is early, and where this does not succeed, Lord Grosvenor or Lord Derby may take its place; Ecklinville is somewhat soft, but is a good cropper; Grenadier and Tower of Glamis should be more largely planted; Mère de Ménage, a finely coloured apple whose tree has a robust constitution; Newton Wonder, Bramley's Seedling, Chelmsford and Byford Wonder, together with Golden Noble, are all varieties of fine quality. In the north, Lane's Prince Albert, Duchess of Oldenburg, Royal Jubilee, and Bunyard's Hambling Seedling, may be included. Some counties and localities have certain varieties which are little known out of their districts, as for instance Styford Pippin, which is extensively grown in Northumberland, but is not found in the south. Again, in Berkshire, an apple named Miller's Seedling is extremely popular, whereas it is not known in Kent. Apples too, of the same variety, often have different names in different districts, and are sold under them in different markets, and therefore the nomenclature is somewhat confusing. In the west of England apples are largely grown for cider, and of late years its manufacture has excited considerable interest, and the cultivation of cider kinds has been greatly improved. The chief varieties grown are Norman, Kingston Black, Red Cowarne, Cherry Hereford, True Foxwhelps, and Wisteton Seedling. The art of making cider is a correct blending of the sweet with the bitter varieties.

Pears.—The Pear requires a sheltered situation, and will flourish on various kinds of soils, if not water-logged. As its roots on the pear stock are far reaching, it is necessary that the soil should be fairly light in texture. On heavy soils the fruit cracks and does not develop, but on the whole it is not so fastidious as to soil as some other fruits.

Early frosts cause considerable damage amongst pears. For market purposes pears grown on the free stock are far preferable to trees on the quince stock, which should be relegated to gardens and cordon work. Trees worked on the former stock attain a great size, and are very profitable. Standard trees on good and suitable land may be planted at a distance of 30 ft. apart, and closer on poorer soils. Pears are planted to a great extent in the west of England for

perry making. Taynton Squash, Thurston Red, Oldfield, Moorcroft, Barland, and Longland are favourite varieties for this purpose; they are not agreeable to the palate, but owing to their astringency and tartness they are admirably fitted for making into perry. Well-grown pears, of good sorts, grown for market are, however, the most luscious and delicious of English fruit, and a well-grown and properly packed basket of pears always commands a high figure in spite of the large importation of this fruit from abroad. They succeed better in the southern than in the northern districts of this country.

Varieties of Pears.—The pears which are worthy of notice are Lammas and Hessele, good market kinds, which can be planted in the north as well as in the south; Fertility: Conference; Dr. Jules Guyot, an improved Williams's Bon Chrétien; Princess, which is an improved Louise Bonne of Jersey; Marguerite Marillet, a free grower; Pitmaston Duchess, a large pear, much grown for market; Beurré Alexander Lucas, which forms a strong standard; Beurré Clairgeau and Beurré Hardy are all good kinds. Beurré d'Amanlis is suited for northern parts of the country. From its straggling habit it does not make a good bush tree. Beurré Capiaumont and Hacon's Incomparable will grow in the north and in exposed positions. Jersey Gratioli and Brockworth Park are free growers as standards. Triomphe de Vienne is also a vigorous sort where the soil and situation are eminently suitable for pear culture, and Doyenné du Comice, probably the finest pear extant, may be grown, together with Emile D'Heyst, Beurré Superfin, and Nouvelle Fulvie.

Plums.—The Plum will grow on lighter and more shallow soil than apples and pears, yet at the same time it thrives on heavy land; in fact it is the most cosmopolitan of all fruits. However, certain varieties have their peculiarities, such as Orleans and Prince of Wales, which prefer a warm soil and situation, while Victoria, Pond's Seedling, and Belgian Purple flourish equally well on heavy or light land.

Owing to the heavy crops which plums generally produce they should be liberally manured. They are usually planted between standard apples in plantations, or alone with soft fruit trees below them (see Fig 2). The plum is worked on the Mussel, Brompton, or Brussels stocks, the first being the most useful for standards. Care must be taken in the choice of plums planted for market purposes, as the taste differs in various localities. In one place a yellow plum is in demand. in another a red

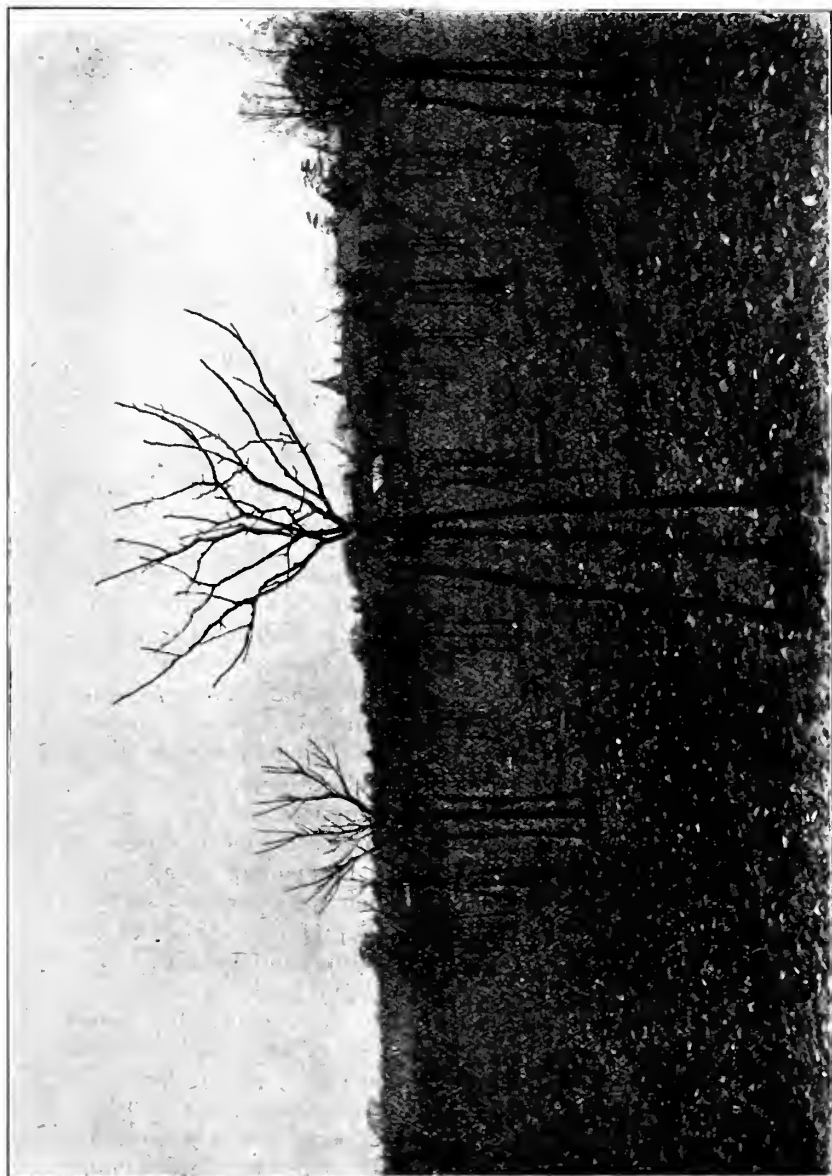


FIG. 2.—A Young Orchard of Plum and Apple Trees.

plum is inquired for. As an instance, the Pershore, a yellow plum, is grown extensively for the Midland markets but has little commercial value in the south, its place being taken by the red varieties. The choicest kinds suitable to the locality should be grown, as in years of glut these will give some return when inferior qualities are unremunerative. Gages may be planted where the soil and situation are suitable, but they are not so hardy as plums and require a warm and sheltered position.

Varieties of Plums.—The first early plum is Rivers's Prolific; the tree is hardy but does not attain a great size. The Czar, brought out also by Rivers, is a good market kind and makes a robust standard. Early Orleans is not grown so much as formerly. The Victoria, usually a heavy cropper, is perhaps the most popular kind, and is useful for all general purposes. Belgium Purple is prolific, and succeeds as a standard. Pond's Seedling, which is large and finely coloured, is the best late plum and is being largely planted. Monarch, a plum also raised at Sawbridgeworth, has been given a good trial and is a great addition. The Czar, Victoria, and Monarch may be given a trial in the north.

The Diamond is largely grown in Kent for market. Amongst the Gages the Old Greengage, which is in great request, Coe's Golden Drop, and Jefferson succeed as standards. The Kentish Bush plum, an upright variety, is used for planting as a screen on the outside of orchards and plantations. The Damson, which was formerly very profitable, is not now planted so extensively, although it hits in occasionally, and gives a good return; but in some recent years this fruit has hardly been worth picking. The Farleigh damson is a favourite in the south, and the Prune is found in the west and north. Other plums worthy of mention are Cox's Emperor, Mitchelson's Belle de Septembre, and Wyedale, the latter a good preserving kind which will thrive in cold positions.

Cherries.—Although the cultivation of the Cherry is mainly confined to Kent, orchards are also met with in the counties of Worcester, Hereford, the western part of Hertford, Gloucester, Buckingham, and Bedford. In Kent cherries flourish exceedingly on the lower greensand and on the deep loams overlying the chalk in East Kent (see Fig. 3). These are well-drained soils, and this is essential to the successful cultivation of cherries. There is no more remunerative outdoor fruit when it is grown to perfection. Home-grown cherries, partly from the perishable nature

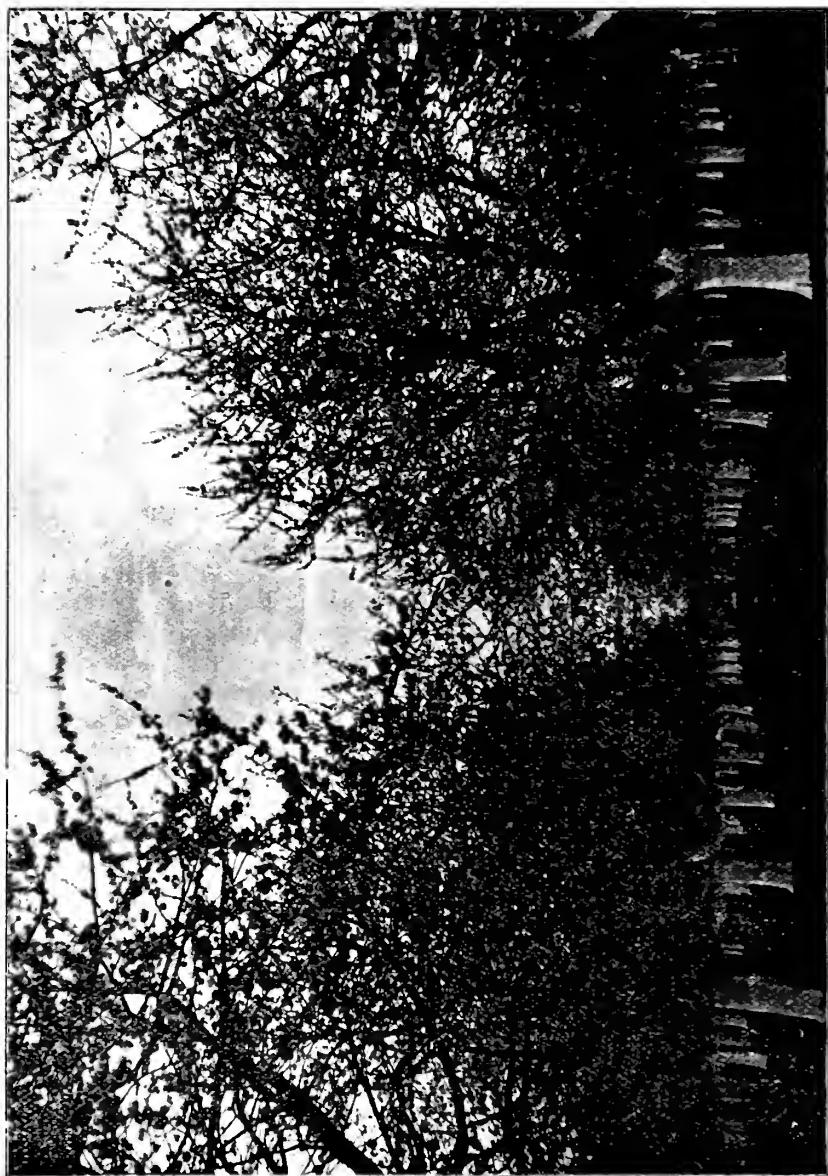


FIG. 3.—A Cherry Orchard in Kent.

of the fruit and also from their finer quality, are far superior to imported produce. The cherry delights in an open, free-working soil with a well-drained subsoil, as its roots penetrate the ground to a greater extent than those of any other fruit tree. Heavy clay land is not congenial to its habit. As the tree blows early it should not be planted in low-lying valleys. The trees are usually planted 30 ft. apart, but are often found at a distance of 40 ft. on favourable land. This wide planting is a distinct advantage, as sheep thrive better where the land is not completely shaded, and some varieties also have a spreading nature and bear the best fruit along the lower branches; for this reason it is preferable to graze sheep in cherry orchards rather than horned stock, as the branches of the trees have to be cut up to avoid any injury from the latter. The tree responds freely to lavish dressings of manure.

The standard cherry is grafted on the Gean, a wild species, which grows in abundance in the west of England, the stones being bought up in great quantities by nurserymen for planting. The Gean stock is used for all varieties of cherries, although the Mahaleb is sometimes used as a dwarfing stock. Some growers hold that land planted with cherry trees should not be cultivated for such a long period as plums and apples, but this is a fallacy, better growth being obtained if the cultivation is prolonged. A cherry orchard of twenty years will sell for 30*l.* and upwards per acre in favourable seasons and is a valuable possession, when it is borne in mind that this price is obtained for the fruit on the trees and that the buyer pays for picking, marketing, &c. The best varieties of cherries are Rivers's Early, Knight's Early Black, Old Black Heart, Elton Heart on stiff soils. Frogmore, Early Bigarreau, Kentish Bigarreau, Black Eagle, Napoleon, Turkey Heart, Tartarian. The New Noble—which is sure to make its way—and Waterloo—which is late and preserves its condition in rainy weather—are valuable sorts. The Morello is a good variety for walls and is occasionally met with as a standard.

For preserving, the Flemish Red is a grand cherry, and the Kentish Red, although smaller, has a wonderful flavour. The Duke cherries are not much used for orchard work, but succeed well in pots or on walls. Cherries for market are better grown on the free stock.

Black Currants.—The Black Currant thrives in a deep, warm soil, and requires a considerable amount of moisture; it perishes where the soil is thin and shallow. It is propagated by cuttings

about 12 in. in length, the buds of the cutting being left on the shoot, as this type of bush is preferable for fruit farms. The bush is not spurred but allowed to throw up young growths. The pruning consists in encouraging these and cutting out old wood. The greatest care must be taken to select young plants free from the Black-Currant Gall Mite—"Big-Bud" as it is commonly called. Every season this mite seems to increase and multiply, therefore the fruit realises higher prices each year. A new variety, Boskoop Giant, is said to be free so far from this infestation, owing it is thought to the bud being close and hard, and if this proves to be the case it will without doubt be largely planted.¹ Of the other kinds Baldwin's is grown in the south of England. Carter's Champion is a good variety and is hardly recognisable from the former. Lee's Prolific is a vigorous sort, and the fruit is large and fit for table use.

Red and White Currants.—The red and white varieties of currants, the latter of which are seldom cultivated on fruit farms, are the least particular of all fruits with regard to their environs. Any moderately good land is suitable for this fruit, and because it is so easily grown its price in late years has been much depreciated. Red currants are mainly used for preserving, raspberries being usually mixed with them in jam-making. The bush is raised from cuttings, as in the case of black currants, but the lower buds are rubbed out in order to form a stem. The red currant bush is spurred in pruning and the cutting is performed so as to form a basin-like bush.

The sorts that are mostly grown are Raby Castle, especially on poor soils, Red Dutch and Scotch, together with the West Country Currant, known also as American Wonder, which has recently been introduced. Versailles and White Dutch are white kinds, but the culture of white currants is generally confined to gardens. The red currant pays for pinching in the summer as the fruit ripens earlier when this operation is performed.

Gooseberries.—There are numerous varieties of gooseberries but only a few enter into fruit farming, and are not grown for their size, as is the case in the Lancashire Prize and other garden sorts, but for their cropping powers. These are enormous in some varieties grown in suitable positions and in favourable seasons.²

¹ See also the remarks under "Insects Injurious to Fruit Trees" on pp. 65, 66.

² As sparrows and other birds pick out the buds of gooseberry bushes it is desirable to put red or black thread or worsted on the bushes in the autumn to scare the birds.

Whinham's Industry, Howard's Lancer, Crown Bob, Lancashire Lad, Rifleman, and Whitesmith answer well in large plantations and are usually met with in the markets. The gooseberry does not succeed on heavy clays but flourishes on fairly light land of a porous nature. It is a shallow-rooted bush and therefore deep cultivation should be avoided. It blossoms early and the blossoms appear before the leaves. Low-lying and exposed positions are therefore unfavourable to its culture, as it suffers from frosts in the early spring. Owing to its great productiveness it is not so much in favour as formerly, as it is not very remunerative unless the fruit is sold early in the season. For this reason large quantities are marketed green; some berries being left on the trees to be picked ripe, and to finish off the ingathering. The gooseberry is cultivated from layers or from cuttings. The plants are easily raised by taking straight pieces of the cuttings about



FIG 4.—Pruned Gooseberry Tree.

14 inches in length from the bushes, and setting them in rows, in a nursery, in the autumn, having first taken off the buds, except those on four or five inches of the upper part. In two years they will be fit to plant out if carefully tended, and in two years more they will produce fruit worth picking. Good plants can be bought wholesale in fruit growing districts at from 6s. to 10s. per 100. Pruning is done from October until the end of January. The rank-growing shoots and branches are cut away, and a moderate supply of young wood is left in the bush, which should be shaped like a cup (Fig. 4). The branches should be trained to droop somewhat. In pruning the bush it must be borne in mind that the branches should be thinned out, and that the fruit crops mainly on the new growth. Some varieties however require spurring. Green gooseberries in some seasons when picked early command a good figure, but the price for the main crop is frequently very low on account of the large additions made to the acreage in recent years.

Raspberries.—The Raspberry is greatly used for jam-making and preserving; it thrives in sheltered positions and on land of a fairly deep and moist nature. The canes are apt to die off on light lands, especially in hot summers. The raspberry is propagated from suckers or offsets thrown out by the old plants. The canes when planted are cut from 18 in. to 20 in. from the ground, the future pruning consists in taking out the old canes, and tipping back the remaining fruiting canes to about 2 ft. or 3 ft. Five or six canes are usually sufficient to furnish a stool or stock. In buying canes, which cost from 11s. to 18s. per 1,000, those which are moderately strong are preferable to large coarse stuff, and are also cheaper.

Some growers place the canes in a furrow, and draw another furrow with a plough against them, but it is more usual and a better practice to dig out a hole with a spade and so plant them. From 7,000 to 9,000 plants are required for an acre, the plants being placed in rows of 3 ft. apart, with 15 in. between each plant; or in rows of 4 ft. 6 in. and 18 in. apart in the rows. The plant is generally cultivated for seven years. An average crop is $1\frac{1}{2}$ tons to the acre.

The fruit suffers from the wet in rainy seasons and requires careful handling. It is picked into galvanised iron pails, and sent to market in tubs to preserve the juice. The price in some years runs as high as 50*l.* a ton. The varieties used in field cultivation are Carter's Prolific, Semper Fidelis (a good preserving sort), Norwich Wonder, and Superlative, probably the best raspberry. Yellow raspberries are confined to gardens.

Strawberries.—The Strawberry succeeds on a large variety of soils, upon the lighter clays and loams, and also upon sandy soils if liberally manured. The cultivation is simple, and is made as inexpensive as possible, as the plant usually lasts for three or four years only. The land must be clean and free from weeds, and should be heavily manured with dung at the onset. The plants cost from 4s. to 8s. per 1,000, and they should be bought as cheaply as possible. They are dibbled in at a distance of 34 in. between the rows, and from 15 in. to 18 in. between each plant, and in some cases 30 in. both ways, so that the horse-hoes can work freely.

Strawberry plants are raised from runners thrown out by the parent stocks. No crop is usually taken the first year. In the second year when the plant is in blossom barley straw or other straw should be placed between the rows to preserve the fruit from dirt. The early fruit is marketed in punnets of 1 lb.

and the main crop in pecks of 12 lb. or rim pecks of 28 lb. The fruit intended for jam-makers is often forwarded in tubs of 56 lb.

After picking, the straw is removed, the runners are cut off, and the plants are earthed up with a mould-board plough. As the existence of the plant is so short it is only usual to manure at the time of planting. Some growers, however, give the plant soot or guano in the spring, which is lightly forked in.

Good market strawberries are Royal Sovereign, the best early strawberry, Sir Joseph Paxton, President, and Waterloo. Laxton is also a very good strawberry. The great point is to grow a firm, handsome strawberry which will travel well.



FIG. 5.—A Pruned Filbert Tree.

Cob-nuts and Filberts.—Cob-nuts are grown for market mostly in Kent and have to a great extent superseded the Filbert, the trees being heavier croppers and producing larger nuts. Undoubtedly they might be grown to a profit in many other localities, as they are not in reality very particular as to soil, but the drawback to their more extensive cultivation is the length of time necessary to form a tree and obtain a return. Nuts thrive amazingly in the neighbourhood of Maidstone where the geological formation is mostly loam overlying ragstone. The detritus of the stone crops up and blends with the loam of the Lower Greensand or the Atherstone Clay. This is an ideal soil for nuts known locally as “coomb.” There are no doubt soils of a somewhat similar character—“stone-shattery” land—in other parts of England, which would also grow nuts to perfection. Cob-nut trees are raised from suckers, or more frequently from layers. They are

planted on arable land at a distance of from 12 ft. to 13 ft. apart and produce a good crop in about 12 years. The tree lives and continues to bear unto a great age. The training and pruning aim at the production of the best quality of nuts and also at checking the tendency to revert to the wild type. A basin shape is the form of a typical tree (Fig. 5); all rank wood is cut out; the nuts are produced on the slender shoots or sprays. A well-grown tree has a stem of from $1\frac{1}{2}$ ft. to 2 ft. high, from which branches are trained to form a tree of from 8 ft. to 10 ft. in diameter and a height of from 5 ft. to 6 ft. The tree bears both male (catkins) and female blossoms, as it is monœcious, and the system of pruning is calculated to give facility in fertilisation.

Strong shoots are broken off in the summer—this is technically called “brutting”—and all suckers are removed from the trunk with a sharp hoe. The land is forked over in the winter, and heavy dressings of shoddies, woollen rags, fur waste, &c., are dug in. The kind of nuts usually grown for market are Kentish Cob, Webb’s Cob, and Cosberd. Some of the nuts are picked green, and the main crop is generally disposed of by the middle of October, although some growers harvest their nuts for sale in the winter. The yield varies from 7 to 12 to 20 cwt. per acre, and in some years the crop is very remunerative. When stored the nuts require turning, otherwise they get mouldy.

PRUNING.

Pruning fruit trees is perhaps one of the most important features in fruit growing. A vast amount of damage can be done by the injudicious use of the knife, and trees and bushes are often robbed of their early promise and fruitfulness by neglect and ignorance in this operation. Some are so hacked as to be almost beyond recognition, whilst others are left entirely to ramble at their own sweet will, and resemble a thicket or an entanglement of brushwood. Years of growth, fruitfulness, and profit are lost by inconsiderate or neglected pruning. The tree remains barren and stunted, or produces only a few specimens of the most meagre and wretched quality. It may be said that more injury is done amongst fruit plantations through incorrect and faulty cutting than from any other cause.

It therefore behoves the fruit grower to bring all his skill, knowledge, and energy towards the perfection of this process. The true principles of this must be grasped and every effort

should be made to obtain enlightenment on the subject. There is no hard and fast rule to be observed or followed; and because one tree requires pruning in a certain fashion there is no law that its neighbour should be so treated, or because one variety is cut hard it is not a reason that another kind should be similarly served, and even if one shoot on the same tree is allowed freedom another adjacent to it should not necessarily be permitted to enjoy the same licence. Pruning, therefore, is not based on dogma, but must depend on circumstances: it is not a doctrine elaborated for any given quantity of trees, but for each individual; it is not carried out by rule or rote, but by observation, experience, and surrounding conditions. The true pruner regards each tree as an individual, not as a conglomeration of trees to be cut and trained in the same form or by the same method. Common sense enters largely into pruning, yet leading principles must be observed and carried out, and in a treatise of this kind the most satisfactory system must be explained.

A standard, and a bush tree—and the latter is only a beheaded standard—are pruned, if planted early in the season, in the year of planting; if planted after Christmas it is better to defer the operation till the following autumn. The shoots are cut back to 3 inches or 4 inches the first year, and from 9 inches to 1 ft. in the second season. The third year 1 ft. to 15 inches is left, and so on, according to the growth of the tree. If the tree is progressing favourably the future pruning need only be slight, but if the growth is weak and sickly the knife must be used more freely. It is right to prune to an outside bud in most instances so as to obtain an open tree, but some varieties which have a drooping tendency should be cut so as to be rendered more upright.

A tree, therefore, should be pruned according to its growth and constitution, and the same law applies equally to each shoot. One object in pruning is to obtain a well-balanced and shapely tree, and the pruner must cut according to his idea of the shape he wishes for, or for the best typical shape. Secondly, the branches must be left fairly far apart to introduce light, air, and sunshine throughout the tree, and to cause the full development of fruit buds and fruit spurs by these means. The free circulation of air is of great importance for the ripening of wood and spurs, and also to increase fertilisation at the time of blossoming. A tree crowded with limbs and branches is also a source of annoyance at picking

time. Thirdly, another object in pruning is to increase and stimulate the growth of the tree, and to force it to become a tree as quickly as possible, and for this reason a long, robust growth is only shortened, whereas a weak and puny shoot is cut hard to incite vigour.

From these remarks it will be seen that a skilled pruner will study these points in the manner suited to each individual tree. It must not be assumed that it is imperative to cut every tree in any circumstance. Some trees, when they get a fair age, make a quantity of wood and growth without producing fruiting spurs and buds, and to cut these rank growths would only excite the growth to a greater degree. The proper course, in such a case, is to leave the tree uncut, and then it will naturally form fruiting wood.

The method of cutting each shoot must also be studied. An incision made half an inch above the bud causes the new shoot to grow out in the shape of a bow from the bud, so that if the tree requires opening or extending this cut is useful. An incision below the bud and slanting up to the bud is a bad cut, as the bud having no nourishment produces a puny and weakly shoot, and the buds below grow strongly, either into the tree, which is to be avoided, or one bud pushes out below the weakly one, and the shoot has to be cut back to this strong bud—a method of treatment which causes loss of wood and growth. The square cut, an incision level with the bud, is a correct one and will produce an upright growth.

Summer Pruning.—Summer pruning, a practice which is too often neglected, is another important consideration. The leading shoot which was cut back in the autumn, not only grows but other shoots are thrown out from some of the side buds below. These latter should be pinched back to six inches in June or July—the leader being left untouched—and should be cut back close in the autumn. This operation is carried out for three reasons: (1) the sap originally carried to the side shoots goes to strengthen and extend the leading shoot, and consequently quicken the growth of the tree; (2) the tree is made more open to light and air; (3) the lower buds are stimulated and ripen into fruit buds. In the case of standards and bush trees a side shoot must be left sometimes to fill up and furnish the tree, especially when the tree is of a spreading nature. These rules, as a whole, apply to standard and bush trees of apples, plums, pears, and cherries, with a few exceptions, which are given below.

Some varieties of apples such as Irish Peach, Beauty of Bath, bear their fruit on the extremities of the branches ; in these cases the leaders are not cut and the pruning consists in thinning out the branches when overcrowded. The pruner must learn these varieties and their peculiarities by observation, and cut accordingly. Plums and pears for the most part come under the general rule of pruning, although Pond's Seedling and Victoria, amongst the former, may be cut harder than most of their species as they produce heavy crops on brittle wood. Plum trees may be allowed to carry more wood than apples, as the size of their fruit is smaller, and in all fruits, a tree bearing a small fruit may be given more licence than a tree bearing a large fruit. Pears, too, may be pruned more lightly than apples, as their colour is obtained rather in the store-house than on the tree. Amongst cherries, Early Rivers, a very remunerative variety, and its allies, which are of a pendulous nature, require that pruning should be considerably prolonged. The Flemish and Kentish Red, together with the Morello cherries, should have their branches thinned out, as they do not produce spurs, neither do they yield a crop on the same wood. In the case of old trees of many varieties, if the branches are cut back to the old wood, they will break again and form new limbs. For pruning standards, and, indeed, for bushes in their higher branches, there is a capital cutting-machine now in use on many farms known as the "Standard" Tree Pruner. These cutters may be 2 ft. or 4 ft. long, or any length, and it is wonderful what large boughs can be cut off by them. For young trees and bushes no ladder is wanted if this cutter is used ; and it is most objectionable to set ladders against young trees. For picking and pruning a step-ladder should be used where possible.

GRAFTING AND BUDDING.

Grafting and budding are so well understood that they need not here be described, and a knowledge of these processes can be better obtained by practice than from any written work. Budding is rapidly becoming more popular and is essential where a new variety, or one that is in great demand, is required. It is the fashion, too, to graft or bud much lower down than formerly, except perhaps in the case of cherries.

The nurseryman usually grafts early in the season and then follows up with budding, as there is no time for the former operation when trees have to be worked by thousands.

Root pruning and lifting need not be described here as these operations are too elaborate and costly for adoption on large areas of fruit land.

PICKING.

Fruit picking is often neglected, and the grower frequently leaves the operation to untrained hands not carefully superintended, who, to save time and trouble, tear the fruit from the trees, bruising and crushing some, and rubbing the "bloom"—a *sine qua non* for the look of fruit—off others. Nor does the injury end here, as by injudicious and rough picking twigs are snatched off, and boughs are broken and rubbed by the careless placing of ladders, thereby causing the trees to gum and canker. The fruit buds and spurs of the next year's promise are often destroyed by rough and slovenly picking. In the case of apples and pears the fruit should never be shaken down, except perhaps for cider making. Ladders should be used, and placed very carefully so as not to injure the trees. Folding ladders may be used for young and low trees and pyramids, and the upper parts of bush trees.

The grower should carefully supervise the picking of his fruit according to the variety, the season, and the demand from the market. Early apples should be picked a little time before they are quite ripe, but the late varieties should be allowed to hang and remain on the tree as late as possible to obtain colour and weight. Pears, which require most considerate handling, should be picked before they are quite ripe. The fruit should be placed gently into the picking bags or baskets when being picked, especially in the case of pears and apples for storing, as the bruises resulting from careless picking cause the fruit to become rotten. Plums should be gathered before they become soft, and should be picked one by one as delicately as possible in order to preserve the "bloom." Cherries should show colour, and be gathered dry. Currants must be gathered free from leaves and twigs, and not when over-ripe. Strawberries are picked when red, but not quite ripe; they are usually gathered on fruit farms at a very early hour in the morning. Choice varieties for dessert should be picked when the dew is off. Raspberries require the greatest management, as they lose their juice and become mouldy if allowed to hang too long on the canes. Soft fruit must be handled lightly in picking so as not to squeeze it. All fruit pays for going over the trees and bushes two or three times, as by this means an uniform sample is secured.

GRADING.

Fruit should be graded so that all the fruits in a package are as nearly as possible of the same size and of the same quality, for when it gets to market its value depends greatly upon the uniformity of shape, size, and colour of the fruit. For the larger fruits, such as apples, pears, and plums, American growers have a wide table covered with soft material, slightly sloping, so that the fruit rolls gently down in the divisions for grading to the packages at the end. In America, frequently, a minimum standard of diametrical measure is adopted for grading apples, but such mathematical precision could not be carried out on large holdings. But apples and pears should be sent to market of uniform size, colour, and quality. Plums and gages should be graded into three classes : (1) for dessert and best culinary purposes ; (2) for bottling, which should be of smaller size, and general cooking requirements ; (3) for jam. Gooseberries require grading : (1) the largest and most handsome and well-flavoured for dessert ; (2) for ordinary eating purposes and bottling ; (3) for jam.

Currants (black and red) and raspberries must be sent to market for cooking purposes of the largest and most uniform sizes. Ordinary small currants and raspberries need hardly be assorted as they will probably go to jam-makers. The largest and best currants and raspberries should be put into small baskets or punnets for dessert purposes, as they generally come into the markets when strawberries are nearly over. The largest and best strawberries are selected for dessert and put into punnets ; the next best go into small boxes or baskets, and a third grade is put into larger packages. Cherries should be treated in a very different fashion from that generally adopted. There is very little attempt made to grade this fruit. An eminent fruit grower and horticulturist from California, Mr. Emory Smith, who paid a visit to the Kentish cherry orchards, was much impressed with the size and vigorous growth of the trees and the quantity and supreme quality of the fruit ; but he literally shuddered as he saw the juicy fruit poured into the baskets regardless of bruising and without any selection or assortment. "Such fruit as this," Mr. Emory Smith said, "we should pick just before it was ripe, handle it most tenderly, and classify it carefully, and put the best into wooden boxes arranged in tiers, and send it to New York and other large cities. Although it would be perhaps sometimes three days or more on its journey it would arrive as fresh as

when packed, and command high prices." It would not be possible to treat a large crop of cherries in this way, but the best at least might be packed in small quantities after the American method, and would be readily saleable in all the large towns in the country.

That all fruit should be carefully graded and packed is an axiom most frequently neglected in practice. Although considerable advance has been made in this respect, stimulated undoubtedly by the foreigner's efforts in this direction and the advice of salesmen, there is room for further improvement. A few small or specked apples, or under-sized or bruised pears, or plums lacking in appearance or colour will ruin the value of a whole package, and fruit thrown together just as it is picked returns only half the price of a consignment which is despatched tastefully and consistently. The whole year's labour and outlay are destroyed by errors at the conclusion, and this is especially prominent in years of plenty. If a corn factor buys a sack of wheat he expects to receive grain of uniformity throughout; if a purchaser of any article in considerable quantities finds that this article is not throughout up to sample he throws up his bargain; and the fruit grower should bear in mind that his customers do not want badly assorted produce, nor do they wish for large and enticing fruit placed above scrubby and diminutive specimens. It does not pay to mix sand and sugar, therefore fruit should be packed fairly, yet in a manner agreeable to the customer's eye. Again, the fruit must be graded, the choice put in one parcel and the seconds in another, and the result will be satisfactory to the producer's pocket. A grower who systematically despatches his fruit uniformly, and in due order, gains a reputation on the market which always stands by him. His salesmen and customers confidently take his goods knowing that they may rely on their genuineness. Fruit should arrive in the nearest possible condition to that in which it hung on the tree.

PACKING.

The packages for fruit are various and numerous, and differ in some degree according to the markets and districts, as they do according to each kind of fruit. Early and late fruit and all fruit of choice kinds should be despatched in fancy baskets, punnets, or boxes, and the more daintily they are packed the better the return. Choice pears, the finest cherries and gages amply pay for special treatment.

An attractive and well-sorted consignment of fruit will often fetch twice the amount of one slovenly and indifferently packed. Not taking into account the choicest fruit which may be decorated with and packed in varied fancy papers, shavings, and cotton wool, the ordinary blue paper of commerce is suitable, but thicker paper is required for apples and pears to prevent bruising. Newspapers answer admirably for packing purposes. Rough grass made into hay makes an excellent covering and lining for the baskets; nettles are also used where procurable, and where the above are not available coarse wood-wool may be employed. The latter, specially prepared in several qualities, can be obtained at a reasonable price. It is important in the packing of choice pears and apples to line the sides with softer and finer wood-wool so that the fruit may not be bruised, putting the coarser description of wood-wool on the top and in the bottom. On large fruit farms a capable man is employed to manage and direct the picking and packing and fully pays for his wages. Fruit growers are frequently urged to improve their packages, but there are difficulties which have to be surmounted. First, the trade is used to the packages now in vogue, and a buyer can tell at a glance the weight of the fruit; secondly, there is a difficulty in the transit and return of frail packages. The willow baskets now generally used, such as sieves, and half and quarter sieves, will stand much rough handling in transit, and are cheap and more easily handled than boxes, and last a long time. If a package could be procured cheap enough to be sold with the fruit an alteration in packages might be feasible, but up to the present it is found that the existing system is the most satisfactory.

Early strawberries and raspberries are marketed in punnets of 1 lb. The main crop of the former is put in pecks of 12 lb.; in crocks of 14 lb. and 28 lb. for culinary uses; and in tubs of 56 lb. for jam-making. Raspberries are also sent in crocks of 7 lb. and 14 lb., as well as in tubs of 28 lb. and 56 lb. Pears and apples are packed in sieves or half-sieves, and cherries in half-sieves. Gooseberries and currants are likewise consigned in half-sieves. Some apples, especially when sent long distances, are now despatched in tubs of about 3 bushels, following the American fashion. The fruit should be placed closely together to prevent rubbing and bruising. The tub is preferable to the basket owing to its smooth sides, and if smaller tubs holding a bushel were to be obtained in any quantity they would become very popular. In the Midlands

apples are marketed in "pots"—baskets holding from 80 lb. to 100 lb. Some of the railway companies supply boxes to fruit growers in several sizes at prices ranging according to size from $1\frac{1}{2}d.$ to $6d.$ per box. These are given in with the price of the fruit. They could be made by the farm carpenter.

SUCCESSION OF FRUITS.

The grower, as it has been said before, should study the requirements of his market. He should plant his fruit accordingly in order to grow varieties which are in demand, and fashion his plantations so as to be able to keep up a constant supply. Whether he sells wholesale or retail he should have fruits so arranged as to furnish his customers throughout the season. In this way his plantation should be set out so as to supply each fruit, and every variety of each fruit to meet the period of its demand. The grower must discover the wants of the public and conform to their tastes and predilections. Instead of sending all his fruit to one market, he must use his ingenuity and energy in despatching his fruit where it is most acceptable and profitable. In one great market there may be a superfluity, in another an insufficient supply of a certain kind of fruit. It is the grower's business to find out these diversities, and market his wares accordingly, and he can do this easily by means of the telegraph and telephone. Fruit carried by road arrives in the best condition; proximity to a market is therefore desirable. Fruit which has undergone a long journey, especially in the case of soft fruits, is often unsightly and in bad condition on arrival. Enterprise in marketing is a great secret of success. If the southern markets are swamped with produce the northern may have a deficiency, and growers should contrive to be well posted up in the requirements of various districts.

Small growers should co-operate in selling their produce. A few large growers find it profitable to have shops of their own and supply them from their own fruit farms. A grower should from time to time attend the different markets not only to learn the condition in which his own fruit arrives, but to obtain information and hints for his future guidance and benefit.

COST OF PRUNING TREES AND OF PICKING FRUIT.

The following Table of average prices paid for pruning and picking, and of the estimated wholesale prices received for fruit crops may be found useful for purposes of reference:—

Table showing average prices paid for Pruning Trees and Picking Fruit, and an estimate of the average wholesale prices obtained for fruit.

Variety of fruit	Average price for pruning	Average price for picking	Average market price
Apple . . .	1l. to 1l. 10s. per acre {	1d. to 1½d. per bushel, not including grading or packing {	2s. to 6s. per bushel
Pear . . .	1l. to 1l. 10s. per acre {	1d. to 1½d. per bushel, not including grading or packing {	4s. to 10s. per bushel
Cherry . . .	1l. to 1l. 10s. per acre	6d. to 8d. per half bushel {	3s. 6d. to 7s. per half bushel
Plum . . .	1l. to 1l. 10s. per acre	8d. to 1s. 2d. per cwt. {	3s. to 6s. per bushel
Gooseberry .	1s. 2d. to 1s. 6d. per 100	3d. to 4d. per half bushel {	1½d. to 2d. per lb.
Black Currant	9d. to 1s. per 100 {	With strig, 3d. per half bushel Without strig, 6d. per half bushel	2½d. to 3½d. per lb.
Red Currant .	10d. to 1s. per 100	4d. to 6d. per half bushel {	1½d. to 2d. per lb.
Raspberry .	3s. 6d. to 4s. 6d. per acre	½d. to 1½d. per lb. {	2d. to 4d. per lb.
Strawberry {	Cutting runners, 2s. to 3s. per acre {	2d. to 4d. per peck of 12 lb. {	2d. to 3d. per lb.
Nuts. . .	10s. to 14s. per 100 {	4d. to 6d. per half bushel in husk {	3d. to 6d. per lb.

INSECTS INJURIOUS TO FRUIT TREES.

As fruit trees are subject to many insect attacks, which require combating with the utmost skill, promptitude, and energy, it is desirable to give a brief description here of those most prevalent and important, as well as of the best means of checking and preventing them. There are other remedies and machines for their application, but those described here are the most suitable for large fruit growers. The most dangerous and destructive of insects injurious to fruit crops is the Winter Moth, whose caterpillars in some seasons strip fruit trees of all their blossoms, fruit, and foliage, and weaken the trees for the next year.

Winter Moth (*Cheimatobia brumata*).—There are several similar species of moths, but the chief offender is the Winter Moth. The females of this moth, as of some other species which injure fruit trees, are wingless, but the males are winged. In the early days of October the Winter Moths and the allied species come from chrysalids in the ground, in the grass, or rubbish around fruit trees, and the females crawl up the trunk and deposit eggs in the folds of the rind of the shoots and branches, near the buds, and glue them to the spot with a sticky substance. The eggs are very small, cylindrical, green

at first, afterwards red. From 150 to 200 eggs are laid by one female. In the early spring, just as the buds swell, the caterpillars come out and get into them; they are dark grey, with flat heads, and so small that it is difficult to see them without a magnifying glass. Later they are greenish with white stripes and brown heads, finally becoming yellowish, and nearly three-quarters of an inch in length. If they are numerous and the season is favourable they quickly clear off leaves and blossoms. When full fed they fall to the ground, and burying themselves in it, or under grass or rubbish, change to chrysalids. When their growth is arrested by cold weather, the leaves and blossoms are sometimes cleared off, and the trees are left as bare as in winter. Apple

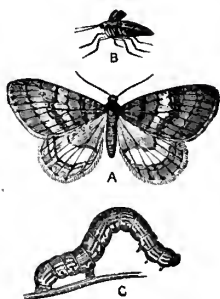


FIG. 6.—A, Male Winter moth. B, Female, natural size. C, Caterpillar, enlarged.

trees are attacked by the caterpillars of these moths; also plum, damson, filbert, and cob-nut trees, and occasionally gooseberry and currant bushes under infested apple and plum trees.

Prevention.—A most valuable mode of prevention against the Winter Moth and its allies is to stop the passage of the wingless female moths up the trees in the autumn and winter months by putting bands of tough grease-proof paper round them, smeared from time to time with cart grease, tar, or other greasy or sticky material. These bands must be examined from time to time, and the grease renewed. Bands made of old manure or oil-cake bags, or even hay-bands, may be used, smeared with sticky compositions, and fastened closely to the trees and frequently examined. Apparatus of permanent nature, made of wood or tin, or even of stout varnished cardboard, are sometimes put round trees to bar the progress of the moths. Grease banding must be done early in October, and the bands must be often looked to. It must be continued up to the end of March, as one species, the "March Moth," does not appear until that month.

Remedial Measures.—Spraying trees is most advantageous, if thoroughly and systematically carried out, and begun as soon as there is the slightest sign of infestation. This can be done by means of powerful garden engines, with long lengths of hose. Hop-washing engines are used in Kent. Knapsack machines can be used for bush and pyramid, and for bush fruits. A wash for the purpose of making the food unpalatable, and so

starving the caterpillars, may be made of the extract of 6 lb. of quassia, obtained by boiling or soaking quassia chips in water, and 7 lb. to 8 lb. of soft soap to 100 gallons of water.

Some growers use arsenates, as Paris Green and London Purple, which poison their food and so kill the caterpillars. Paris Green is largely used in America. It is mixed in powder or paste form—the latter being better and less dangerous—at the rate of 1 lb. to from 200 to 280 gallons of water according to the kind of fruit trees, and the age and condition of the blossom and leafage. If used too strong these will be burned. Great care must be observed not to make this wash too strong, and not to put stock under trees on grass that have been sprayed until rain has washed the grass. This wash should not be employed where there are gooseberry bushes or vegetables under the trees.

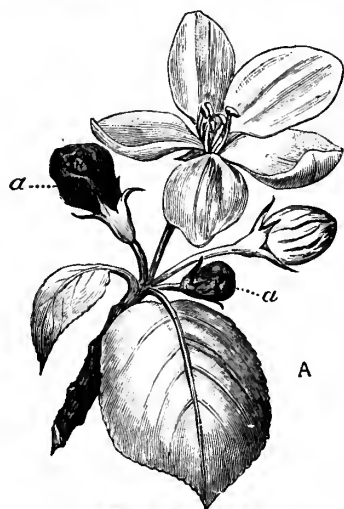
Apple Sucker (*Psylla mali*).—The harm done by this insect is not realised, as it is so small and so closely concealed in the buds, and is at first coloured like the leafage, that it is easily passed over, at all events by casual observers. The larvæ exhaust the juices of the buds and cause decay, and prevent fructification of the blossoms. Eggs are laid in September and October, and even in November, on the youngest shoots of fruit trees. These hatch on the first approach of spring, and the tiny, flat larvæ get into the nearest buds and feed upon them, causing much harm in some seasons.

It is not possible to affect the eggs of the *Psylla*, or of the Winter Moth, or indeed of most insects, as they are protected by hard shells; but infested trees should be sprayed early in the spring with the quassia and soft-soap washes, as used for Winter Moth caterpillars, or with a Paris Green wash to poison the young larvæ or to make their food distasteful.

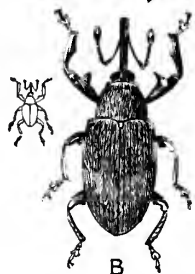
Aphides of various kinds infest apple, plum, and damson trees, and currants. These can be cleared off by early and frequent sprayings with quassia and soft-soap washes. And as to spraying generally it may be said here that to be effectual it must be done early, and repeated if necessary. Some growers spray regularly and systematically, beginning very early and continuing late, as a matter of ordinary treatment, with the greatest advantage, and, as the insects which attack fruit trees increase alarmingly, it is incumbent on all growers who wish to succeed to follow their example.

Apple Blossom Weevil (*Anthonomus pomorum*) is often very troublesome to the apple and pear crops. The mischief is frequently attributed to caterpillars or the Apple Sucker. On

examination of infested blossoms a small, legless maggot will be found in them feeding on the stamens and pistils, and causing the flowers to wither and decay. The weevils, or beetles, pass the



A



B

FIG. 7.—A, Spray of apple-blossom; the buds marked *a* are attacked by the weevil. B, the Apple-blossom Weevil, enlarged. The natural size of the weevil is shown on the left.

summer in the perfect state, living among the leaves of the trees. When winter comes they get into chinks in the bark, or under stone and grass and rubbish around and near the trees. When spring commences they crawl up the trees, and deposit eggs in the fruit buds by boring holes in them with their snouts, and thrusting the eggs into the holes with stylets or ovipositors. If the weather is warm and forcing, not much injury is caused, but in cold springs when growth is retarded, as is so often the case, serious harm is done.

If, as is asserted by Curtis and Schmidberger and some other entomologists, the female weevils crawl up the trees to lay eggs in the blossom buds, the bands smeared with sticky compositions used for preventing Winter Moths from ascending the trees will also hinder those weevils from ascending which pass the winter in the ground, or in grass and rubbish near the trees.

Spraying, as a means of killing or starving, is not available in the case of this weevil, as the larvæ which do the harm are ensconced in the blossom buds and cannot be reached. As one mode of prevention it is desirable to spray the trees in the winter with a wash composed of 1 lb. of sulphate of iron to one gallon of water, thrown up over the branches and trunks with a powerful engine, to kill lichens and mosses that serve as harbour for the insects. In Brittany, where it is most troublesome, the fruit growers scrape the trunks and branches with scrapers, and brush every part with stiff carpet brushes. Cloths

are placed round the trees to catch the weevils that may be dislodged and the pieces of bark. These are collected and burned.

It would be useful to spray the trees in the early spring with kerosene emulsion, made by dissolving half a pound of soft-soap in boiling water, adding two gallons of kerosene or paraffin oil, churning the mixture with a force pump until it is of the consistency of cream, and mixing with nine gallons of water. This should be sprayed all over the branches and shoots in a fine mist. It would make the surroundings disagreeable, and might prevent the weevils from laying eggs in the sprayed buds.

Codlin Moth (*Carpocapsa pomonella*).—The caterpillars of this moth bore into apples and cause them to drop prematurely, to decay rapidly when stored, and to spoil the sample for market. The moth lays from 50 to 100 eggs, and places one on each apple in May and June. A caterpillar comes forth, and bores at once into the apple, generally at the "eye," making for the pips on which it feeds, and when full fed it makes a passage to the outside of the apple and falls to the ground, and crawls up an apple tree, remaining concealed under the bark or among lichens and mosses, pupating at the first approach of spring.

To prevent this attack it is desirable to fasten bands of old oil-cake or manure bags, or hay bands, tightly round the stems of the trees early in the summer, having scraped off the old bark that they may fit closely. These must be examined from time to time, and the caterpillars in the folds destroyed. It is well to have two of these traps, so that if the caterpillars pass one they may be stopped by the other. In some American orchards the trees are protected by permanent traps of wood and tin. "Windfalls" or "drops" must be cleared away often in infested orchards, and disposed of at once. Sheep, horses and pigs are useful in these circumstances in orchards, as they eat the "drops" as fast as they fall.

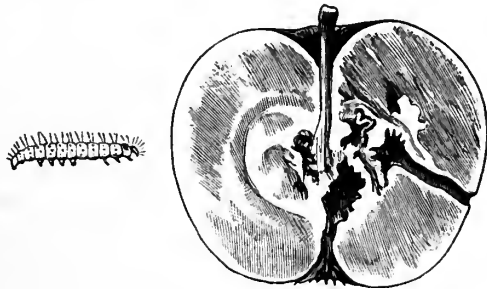


FIG. 8.—Fully-grown larva of the Codlin Moth, and infested apple.

Woolly Aphis (*Schizoneura lanigera*).—There has been an increase lately in the injuries caused to apple trees by the “Woolly Aphis.” It is especially injurious to young trees whose bark is tender, and easily pierced by its sharp beak.

It appears in the form of bunches of a white woolly or cottony substance on the stems, branches, and twigs of apple trees, particularly in scars and cracks caused by bad pruning, careless fastening to stakes or supports, and by hail. After the extraordinarily severe hailstorm in a small district in Kent, in 1902, which made deep wounds in many young trees and young shrubs, and the smaller branches of trees, it was noticed that there was an unusual attack of the Woolly Aphis. These woolly bunches contain groups of aphides in various stages, some of which are clothed with fine, woolly coverings, and are piercing the denuded surfaces and sucking up the sap. Extravasation of sap occurs and warty excrescences are formed, affording food and shelter for the numerous generations of larvæ which soon cause the whole branch or stem to lose vigour and fruitfulness. When fruit bearing spurs or twigs are attacked they soon die. Plum trees are sometimes infested by this insect. It also affects the roots of apple and plum trees, causes them to form warty growths and to lose sap, and consequently vigour.

Prevention and Remedies.—Infestation is principally occasioned by the aphides being wafted by the wind, by means of their woolly coats, from tree to tree. Continuity of existence is ensured by females, which hibernate in the bark among lichens and mosses and lay eggs, and, principally, by larvæ, which also hibernate snugly in their woollen coats under the bark, in wounds and scars, and upon the roots.

It is most important that apple trees should be kept clear of lichenous and mossy growths, which harbour all kinds of insects, and keep light and air from the branches. There cannot be too frequent iteration of the injunction to keep all branches, shoots, and twigs clear of these parasitic intruders. To get rid of them very finely powdered quick lime should be thrown all over the trees in damp weather in the winter, by men having scoops, like flour scoops, fastened to long poles. Sulphate of iron, dissolved in water in the proportion of 1 lb. to one gallon of water, sprayed over the trees in late autumn or winter will kill lichens and mosses, and interfere with the woolly aphides. When they are discovered in wounds and scars these should be smeared in the late autumn with a thick compound of soft-soap and paraffin oil, in the proportion of

three gallons of paraffin to 4 lb. of soft-soap, churned up well together, and twenty-five gallons of water, applied with a brush. Infested trees should be sprayed all over with a mixture of 5 lb. to 6 lb. of soft-soap and five gallons of paraffin to 100 gallons of water. In mixing this wash the soap should be dissolved in hot water, the paraffin added while the water is hot, and the whole churned together by a hand pump or syringe. Cold water should then be added.

The wounds and scars so infested may be treated with hot lime wash having powdered sulphur in it, worked well in with a brush.

Black-Currant Gall Mite (*Eriophyes ribis*).—Description has been given above of the chief enemies of fruit growers. There are many others, but none whose attacks are so serious, except that of the Gall Mite of the black currant which bids fair to stop the cultivation of this valuable fruit, unless a remedy against it is discovered. This mite gets into the buds and lives upon their contents, causing them to swell, so that the disease is often called "Big-Bud." Picking off



FIG. 9.—A, Portion of bud, with mites crawling and standing erect. B, Erect mite more highly magnified.

the swollen buds has been tried, also cutting down the bushes periodically, and spraying with various washes, but all to no purpose, and the mite multiplies exceedingly in spite of all endeavours. Entomologists and practical men have devoted much thought and time to the study of this pest, and its life-history has been investigated and described by Mr. Cecil Warburton, Zoologist to the Royal Agricultural Society.¹ A new variety of black currant, known as "Boskoop Giant," has been introduced from Holland, which, it is said, is not liable to be attacked. This has yet to be proved. Without any doubt the spread of the mite is due to carelessness in distributing cuttings from infested plantations. The greatest possible care should therefore be taken to get cuttings or young bushes from plantations free from infestation. Intending purchasers of black

¹ Journal R.A.S.E., Vol. 62, 1901, pp. 257-266; Vol. 63, 1902, pp. 131, 133, 304, 305; Vol. 64, 1903, pp. 310, 311.

currant plants are strongly advised to have them inspected and certified as free from "Big-Bud," by a qualified expert, before running the risks incident to the planting of infested shoots.

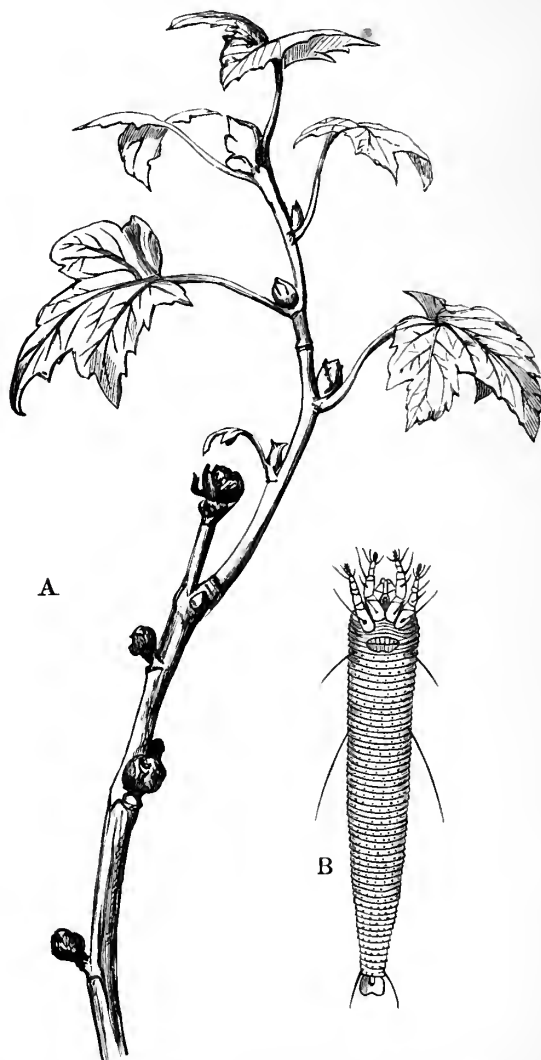


FIG. 10.—A, Infested black-currant twig, showing old wood with dead buds, and new wood with sound and diseased buds. B, The mite enlarged about 200 times, ventral view.

CHARLES WHITEHEAD.

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PRACTICAL HINTS ON VEGETABLE FARMING.¹

INTRODUCTION.

AN increasing population creates a growing demand for vegetables as a necessary food ; increasing wealth causes a larger demand for those vegetables which are generally looked upon as luxuries. As the demand increases more land is required for their production, a larger number of persons embark in the necessary operations, and more capital is invested annually.

Vegetable culture, in conjunction with fruit growing, is a profitable undertaking during an average of years ; and if any reader doubts the statement, let him journey to Evesham, and inspect the town and surrounding district in a normal year. There are about nine thousand acres devoted to market gardening within a radius of six miles of Evesham, and the rental value of the land varies from 3*l.* to 12*l.* per acre.

Very little animal manure is available in the neighbourhood, and resource has to be had to fish guano, nitrate of soda, leather dust, shoddy, hoof-parings, soot, and mixed fertilisers. In addition to the horses necessary for work on the land and for taking the produce to market and railway station, pigs and poultry are kept. By carefully saving the residue of the crops—the value of which as plant food I hope shortly to show—a small amount of manurial matter is obtained. This, supplemented by the fertilisers previously mentioned, serves to nourish the splendid crops of vegetables for which the Vale of Evesham is justly famed.

In these days the competition in market gardening is very keen, and the profits are not so large collectively as they have been in former years ; hence, practical and shrewd men keenly watch all out-goings in the matter of seeds, manure, and labour. They feel that they cannot afford to incur risk of failure in experimenting with untried novelties, and they wisely adhere to their old friends, the Offenham cabbage and the Schofield lettuce, as well as to the Pershore plum, notwithstanding all its traducers have said and written.

¹ Copies of this article in pamphlet form are available for distribution. Price 1*s.* per copy through any bookseller, or 6*d.* per copy on direct application to the Society by Members.

But although they rely upon well-tried friends, they are not prejudiced against new ones, or those with satisfactory credentials; consequently market gardeners, and farmers who combine some market gardening with their farming, are a progressive class, though the progress of a few individuals may be but slow.

Without further preface I propose to describe some of the principal vegetable crops, and the cultivation suited to each of them. For convenience of reference they are placed in alphabetical order. The illustrations are reproductions of photographs of crops grown at the Worcestershire County Council's Experimental Garden at Droitwich, and they should be studied in conjunction with the special experiments of which the results are given on pages 98 and 99.

DESCRIPTION OF VEGETABLES.

Artichokes.—The so-called *Jerusalem Artichoke* grows from six to ten feet high; it is very accommodating as to soil, is easy of culture, and it may be, and frequently is, planted where many other crops would fail. It is also planted in situations where a screen is desirable during the months of summer and autumn. Its stalks and leaves form excellent forage for cattle; and the tubers are much relished by many persons, though disliked by others.

The details of culture are few and simple:—Plant at any convenient time from November to the end of March. Select tubers of good shape—ill-shaped tubers produce ill-shaped progeny—and plant upon well-tilled ground in almost any position that is desired. The rows should be thirty inches apart, and the plants fifteen to eighteen inches apart in the rows; the tubers should be planted four inches deep.

Globe Artichokes may be propagated either from seed or by division. The latter is the method usually adopted where a stock of it exists. The plant has a tendency to deteriorate in vigour after several years' cultivation; hence it is advisable to make a new plantation every two or three years. This is easily done by dividing the old plants and replanting upon deeply dug and well-manured ground. Plant in rows four feet asunder, and three feet from plant to plant in the row.

Where there are no old plants to be divided, a stock of plants may easily be raised from seed. Sow the seed in March, on rich soil, and in drills one to two inches deep, and twelve inches apart. Transplant the seedlings, when large enough to

handle conveniently, upon well-prepared ground exactly as advised for divided plants. Water them after planting and during dry weather until they are well established. Hoe the soil frequently during summer and autumn ; and in November place some long manure close up to and around the plants, with the double object of feeding and protecting them from injury by frost during winter.

Asparagus.—This, a native of Great Britain, is one of the greatest delicacies which our market and kitchen gardens afford, and it is particularly valuable from the early season at which it is produced. Within a radius of six miles of



FIG. 1.—Asparagus in single rows, 3 feet apart.

Evesham hundreds of acres of *Asparagus* are grown, and the crop forms the chief source of revenue for the support of many scores of families in that district. It is a profitable crop to grow for market, and will realise, under specially good culture, nearly 70*l.* per acre ; but an average crop yields about 40*l.* per acre.

The old-fashioned method of growing *Asparagus* in beds, five feet to six feet in width, has been long abandoned by good cultivators ; and we seldom find more than two rows growing upon a narrow bed. But the rule now is to plant *Asparagus*

in single rows (Fig. 1), and I think it is a good one. An Asparagus plant will pay well for space afforded it, and it is difficult to understand why Asparagus has so long been considered to require over-crowding, which means suffocation and starvation.

All growers of Asparagus should remember that the plant retains its own special characteristic from infancy to old age. If, as an infant, it produces a large number of small shoots, or a smaller number of stronger lateral shoots, this habit of growth will continue to the end of its existence, the strength varying a little in each case according to the cultivation.

Cultivators may, therefore, at will, produce rows of small, medium-sized, or large "heads" by carefully selecting the plants in their infancy—say when they are twelve months old and just producing their little plumes. A grower who desires to have the largest Asparagus will reject the plants producing five or six small shoots, and will select and plant only those which produce two or three strong shoots. If there is a secret in obtaining large Asparagus, that is the only one; everything else is purely a matter of cultural routine.

The best policy is to form a seed bed in April by sowing seed of any favoured variety. Sow the seed one inch deep in drills twelve inches apart, and place each seed two or three inches apart in the drill. This takes a little more time, but the time is well spent, as will be found the following April, when the seedlings are lifted preparatory to being sorted and planted in their permanent positions.

In twelve months after sowing the seed the Asparagus plants will be in the best condition for transplanting. Every additional year's delay allows the interlacing and undue extension of the roots, with proportionate injury and destruction when the plants are subsequently lifted for planting out. This means a serious loss of time and weakened plants.

Asparagus is not very particular as to the mechanical nature of the soil, providing it is not water-logged. It thrives upon sandy and very porous soil; it grows vigorously upon stiff soil; but if water lies for an undue length of time upon the latter kind of soil, the root-action is materially reduced, many roots perish, and the plants become either very much enfeebled or they die.

Manuring for Asparagus is very important and is often misunderstood. Some persons think that salt is the only requisite manure, because *Asparagus officinalis* grows near the sea. Soot dealers recommend soot as the best manure for

Asparagus, and there are growers who believe them. Mixed chemical manures are good, and, of course, farmyard and stable manures are also good.

Some experiments as to the comparative effects of different manures, which were conducted by me during the four years, 1900 to 1903, showed that although stable manure gave the greatest average weight per acre, mixed chemical manure gave at all times the brightest and most tender "heads" of Asparagus; and the conclusion deduced from the experiments is that a combination of animal manure and mixed chemical manure will give better results in quantity and quality than either is capable of separately. I am also of opinion that salt alone or soot alone may stimulate growth for a short series of years, after which the Asparagus becomes rapidly exhausted and the beds or plantations are comparatively worthless. New beds and young plants must then replace the old ones.

The successful cultivation of Asparagus, briefly stated, consists in selecting the strongest plants from one-year-old plants having all their roots intact, planting upon soil not water-logged, and rich enough to produce a good crop of cabbage, potatoes, or turnips, and planting in single rows three feet or three feet six inches apart, with the plants twenty inches to twenty-four inches apart in the rows. If the site of the Asparagus plantation is naturally wet then the plants should be planted on ridges above the ordinary level.

Crops such as lettuce, dwarf beans, radishes and onions may be grown between the rows of Asparagus during the first and second years after planting, after which the ground ought to be given up entirely to the Asparagus.

The subsequent routine of culture consists in the annual manuring or feeding of the crop—not forgetting liquid manure (where its application is practicable)—before and after the cutting season; the moulding over with pulverised soil to any depth reasonably desired before growth commences each spring; and the annual cutting down of the Asparagus in November, together with the levelling of the soil which had been placed over the Asparagus in spring. The growth of weeds must, of course, be prevented. It is finally important to observe the precaution not to cut all the strong shoots and leave all the weak ones during the cutting period, and not to continue cutting too long each season.

Beans.—*French or Dwarf Bean.*—This will not bear frost without injury, but will thrive in a high and moist temperature.

Crops may be obtained during every month of the year, by sowing and growing in artificially heated glass structures in autumn, winter, and spring, and by sowing out of doors in April and May.

For a supply in late autumn and winter the seed should be sown in soil in frames, heated by means of hot water, in July or August. Another sowing should be made in January, to be followed by monthly sowings, according to the demand and convenience. A temperature of 65° by night and 75° by day suits them admirably. Syringe them several times a day to keep in check their great enemy the red spider.

The earliest beans from the open air may be obtained from seed sown at the beginning of April at the foot of a wall facing south, and especially from a border at the front of, and in contact with, a hothouse, early vinery, or early peach house. The beginning of May is a good time for the earliest sowing where no shelter is available. French Beans are a good paying crop when grown early, realising from 6*d.* to 2*s.* per pound, according to the season. "Ne plus Ultra" is a good variety for the purpose. The demand for French Beans falls off rapidly when runner beans become available.

Runner Bean.—These make one of the most valuable crops in the kitchen garden, and a generally fair paying crop in the market garden. The earliest Runner Beans in the market realise the highest prices, and when those prices are 6*s.* to 8*s.* per bushel of 40 lb., as in 1903, and the crop is at the rate of upwards of 200 bushels per acre, things look roseate. If the crop average 3*s.* per bushel for the season, we have the satisfactory price of 30*l.* per acre for a crop which is on the ground not more than six months, and which leaves the soil in good "heart" for another crop.

For the early pods probably the beginning of May is about the best time for sowing the seed. But Runner Beans may be sown as late as the end of June, if a large supply of the best pods are desired through September and October. If the intention is to use sticks to the beans the rows should be sown about five feet apart; but if sticks are not to be used then the rows should be three feet apart. Many hundreds of acres of Runner Beans are grown for market in this way, the climbing shoots not being allowed to extend themselves at will, but being repeatedly cut back to two new leaves. The plants are thus kept dwarf and within the limit of the three feet allotted to them. The accompanying illustrations (Figs. 2 to 4)

on pp. 74 and 75, represent Runner Beans grown without sticks. They are from photographs taken on September 7, 1903.

Broad Bean.—This is a valuable and accommodating crop from the consumer's point of view, but it is not likely to make many growers wealthy. The wholesale prices vary from 4*d.* to 2*s.* per bushel, and as 300 bushels per acre is a good average crop, 15*l.* per acre may be considered a fair return. But the Broad Bean has another value, it is a good nurse for vegetable marrows and ridge cucumbers. A series of rows of beans at four or five feet apart provide nice shelter for the more tender successional crops, hence it is worth more than its actual market value when used for this purpose.

The earliest sowing may be made at the end of October; the next in January or February; and for successional crops up to the month of May or even June. Autumn-sown beans are liable to rot during a wet winter.

Beet.—The Beet-root of gardens is a tender biennial. It requires a deep and rich soil in which to grow to perfection. Fresh applications of manure are superfluous, and may be harmful, as bifurcation of the root is thereby frequently caused.

Good Beet should be three inches to three and a half inches in diameter at the widest part. The root should be gently tapering to the extremity, straight and smooth, and symmetrical in outline, very dark crimson in colour, and nearly destitute of fibre. Ground which has had runner beans or celery as a previous crop will produce Beet of the quality described if seed of a good variety is sown about the end of April.

The seed should be sown in drills an inch and a half deep, and the drills should be fifteen inches apart. When the seedlings are sufficiently large to handle they should be thinned out to eight or nine inches apart.

Lift the roots carefully at the end of October and store them away in frost-proof pits, "burries," or sheds.

It has been my custom during the last twenty-eight years to bastard-trench, each winter, the ground upon which I propose to grow beet, carrots, and parsnips. By adopting and continuing that system, my root crops have always been excellent in quality and quantity under otherwise normal culture. Other crops are also better when the rotation carries them to the more deeply cultivated ground; and in due time the whole area has undergone the same operation, and is repeated about every five years. By this system the beet crop



FIG. 2. Runner Beans grown without sticks.
(Chemical manure only. Crop, 131 bushels per acre)



FIG. 3. — Runner Beans grown without sticks.
(Garden refuse only. Crop, 389 bushels per acre)



FIG. 4.—Runner Beans grown without sticks.

(Stable manure and mixed chemical manure. Crop, 482 bushels per acre.)

averages 25 tons, parsnips 19 tons, and carrots 15 tons per acre. (See Fig. 5.)

Yield per acre.

Tons cwt.
14 6

Tons cwt.
29 0

Tons cwt.
21 11



A
(Mixed chemical
manure only)

B
(Stable manure and
mixed chemical manure)

C
(Stable manure
only)

FIG. 5.—Beet-root grown in 1902.

Borecole, or Kale.—This is a hardy indigenous biennial, and a most useful vegetable; but it is not a very profitable crop for

the market gardener, unless after a very severe winter, when it stands almost alone unscathed among the brassica tribe. Seed may be sown from the middle to the end of April, and the crop may be planted in July, if possible; later planting necessarily produces imperfectly grown plants and a smaller crop. The soil must be in good condition, and the manures recommended for cabbage are also suitable for this crop.

Broccoli.—The Broccoli is a British biennial and a hardy plant in its uncultivated state. Many crops of this valuable vegetable are lost nearly every winter, mainly because they have been grown too luxuriantly and rendered less hardy than is their nature.

As this plant is grown for use chiefly during winter and spring, and so must bear the cold and inclemency of our winter, we ought to adapt our cultural treatment to the production of plants that are fully grown and hardy.

We usually associate “woodiness” with “hardiness”; and “woodiness” is very often—if not always—indicative of slow growth. Broccoli plants that have been grown slowly—other conditions being equal—are nearly always more “woody” and hardier than others not so grown. How is this maximum size of the Broccoli plant to be obtained combined with hardiness? Chiefly by allowing a long period for maximum development in conjunction with abundance of air and light.

The market gardeners around Tamworth and Lichfield excel in the annual production of abundant crops of fine Broccoli. Their soil is mainly gravelly, on a subsoil of gravel; such soil is seldom over-manured or too rich for healthy growth in the Broccoli plant. Here then we have the key to success in the culture of the plant, and I have verified it in other places with soil as poor, but of a different geological formation. The routine of culture which I adopt and recommend is briefly as follows: Sow Broccoli seed in April; prick out the plants at the end of May; plant out at the end of June during damp weather; plant upon firm and rather poor soil; plant widely apart—thirty to thirty-six inches each way; plant in an exposed rather than in a sheltered position. I have received testimony from many sources in the county of Worcester since 1891 as to the success of this method.

Brussels Sprouts.—This is a hardy biennial, and a useful and profitable vegetable to cultivate. It is easy of culture, continuous in bearing, and generally profitable. In value it may be worth anything between 20*l.* and 40*l.* per acre, according

to the season. An imperial acre will hold 6,970 plants at thirty inches apart each way. And as a thousand strong plants ought to be obtained from each ounce of good seed, half a pound of seed is sufficient to give an adequate number of strong plants for an acre of ground.

In order to obtain a full crop of Brussels Sprouts it is absolutely necessary that the plants be grown to their maximum size before November. Any growth after that period is worthless. The crop requires and deserves generous treatment in all respects as regards food, air, and light, because a large amount of vegetable tissue has to be developed, and it must be of good quality to withstand the severity of our winter without injury.

Some growers sow the seed where the plants are to remain, and thin out to distances of twenty or twenty-four inches in the rows; and they say they gain by so doing.

The more usual method is to sow the seed in February or March in a sheltered position, or under glass; to prick out the plants when in their second rough leaf in April or May; and to plant out permanently in June upon well-manured and well-prepared soil in rows thirty inches apart, the plants being two feet apart in the rows. I prefer this method of culture myself, and have this way produced very profitable crops; possibly under some local conditions the former method may answer best.

Cabbages.—From a market gardener's point of view the chief value of Cabbage is as an early crop in spring, when, according as to whether the previous winter has, or has not, killed a large portion of the vegetable food supply, it may be worth from 20*l.* per acre to an almost fabulous amount.

Seed, for a supply of nice heads of Cabbage at the end of March and in April, should be sown from the 10th to the 14th of the previous July. And in order that there may be no "bolting" or premature flowering, care should be taken that the seed be sown upon thoroughly moist soil. In the absence of rain, the seed bed must be artificially saturated in one of two ways, either by applying the water to the soil previous to drawing the drills for the reception of the seed, or after the drills have been drawn. The former is seldom effective, and often causes a large percentage of the plants to "bolt," the flowers being formed in the seedlings during that period of starvation through lack of water; the latter retains the water in the drills, where it sinks downwards and is stored for future use, and gives a constant supply of moisture to the seedling

plants whilst they are in a critical stage of their existence, thus promoting leaf-formation instead of flower-formation.

My custom is to plant Cabbage soon after clearing off the early peas. The ground is hoed and the rubbish removed, and the Cabbage planted early in September upon the ground previously occupied by the peas. Such soil is in good condition for the Cabbage, which quickly becomes established, and continues to make moderate but satisfactory growth during autumn and winter. A rank growth during autumn is undesirable, because fifteen degrees of frost during winter will destroy it.

As this crop of Cabbage is cut before it attains its full size, it is unnecessary to plant it so widely apart as if it were planted in spring for use in June and July. If planted in rows fifteen or sixteen inches apart, and the plants twelve or fourteen inches apart in the rows, there is ample space for development and the ground is well covered by the crop.

The crop is earlier ready for cutting if there is shelter in the form of dwarf apple or plum trees, or in some other form.

Frequent hoeing between the crop also hastens maturity; the reason for this is not so well understood as it ought to be. The frequently broken surface of the soil admits the rays of the sun and the warm air to the roots of the plants. The broken surface of the soil also prevents the escape from the soil of moisture, without which there can be no appreciably healthy growth.

Fertilisers may be applied in February and March with advantage, and should be hoed in at once. Fish guano, nitrate of soda, and mixed chemical manures are each used, and each kind gives good results. A mixture of nitrate of soda, kainit, and superphosphate of lime gives the darkest coloured, sweetest flavoured and most compact cabbage. Fish guano and nitrate of soda give larger but not heavier cabbage.

After impartial trials of various varieties I have not found any superior for earliest cutting than the true Myatt's Early Offenham.

Coleworts, or Collards, are sometimes very useful and valuable as a catch crop which is not long on the ground. Sow seed of a quick variety about July 15th. Plant them out a foot apart in the rows and fourteen inches between the rows. Draw the Coleworts as they attain a saleable size and can be disposed of advantageously. The ground is then ready for preparation for the following crop.

Red Cabbage.—The seed should be sown about the beginning of August, and may remain in the seed-bed during the winter, or may be transplanted in October, either to their permanent quarters, or to another bed, in which they will be pricked out three inches apart. But whether planted out permanently in autumn or spring, the ground must be heavily manured for their reception. The large solid globes of red foliage, which all desire, cannot be formed out of nothing. Raw material must be present in abundance, either in the form of soil very fertile by nature, or of a liberal supply of plant food from the use of manure.

Red Cabbage must be given space in which to grow. Useful cabbages may be grown two feet apart in each direction, but those weighing ten to twenty pounds each require to be grown quite three feet apart in all directions.

Savoy Cabbage.—Seed of the Savoy Cabbage may be sown in March or April, pricked out in May, and planted out in July. The seedlings may advantageously be planted after early peas, early broad beans, or early potatoes. It is unnecessary to do more than clear the ground for the reception of the crop, unless the soil is stiff in character, when a light forking or ploughing will be a distinct advantage.

The Drumhead variety should be planted in rows two feet apart, and eighteen inches apart in the rows. Smaller varieties may properly be planted more closely together.

Carrots.—The Carrot is a biennial, and a native of Great Britain. The root of the plant in its wild state is small, dry, tapering, and strongly flavoured, and neglect in cultivation induces the plant to revert to its original state. The market value varies with the season of the year and other things, and the crop is liable to vary in quantity and quality. A bad crop may not realise 10*l.* per acre; a good crop may be worth 40*l.* per acre.

Carrots like a comparatively deep and friable soil, and if they follow such crops as celery, or any leguminous crop, they usually grow well, especially if sown upon ground prepared as recommended for beet and parsnips. Good varieties for domestic purposes are St. Valéry, Scarlet Shorthorn, and James's Scarlet Intermediate. Any favoured selection of the Shorthorn type is usually sown for the earliest pulling, and it is generally sown in frames (heated or unheated), on hotbeds, or on very warm borders under walls.

When grown on hotbeds or in other frames carrots should have nice and friable soil about six inches deep in which to grow,

and the drills should be four inches apart. Unless conveniences in the way of frames, &c., are available, it is not worth while to attempt to grow very early Carrots. The earliest sowing should be made in a warm position, and pulling may commence when the roots are as large as a man's finger. In such a case it is a mistake to thin the seedlings to more than an inch and a half apart, because the later removal of the usable roots will give the further space required. The same principle applies to the main crop sown in April; when the Carrots are thinned they should be left about two inches apart if it is intended to commence pulling as soon as they are large enough, then every other Carrot should be removed, leaving them four inches apart. By the time one lot of Carrots is used or sold, we may repeat the operation, leaving the remaining crop at eight inches apart. Thus we have, at the end of the growing season, a bed or field of Carrots almost perfect, after having withdrawn a constant supply.

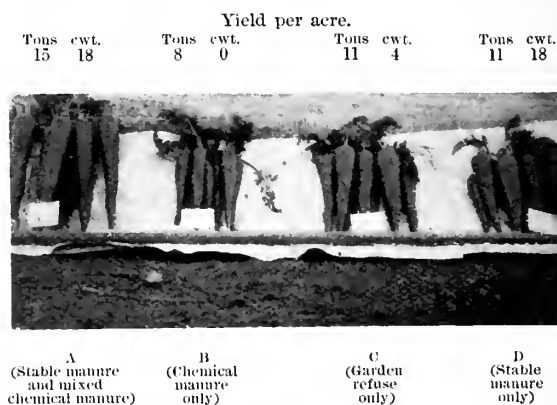


FIG. 6.—Carrots grown in 1902.

When Carrots are attacked by wireworm, I have always succeeded in at once arresting the attack, and improving the Carrots, by a liberal dressing of rape meal manure.

Cauliflower.—The Cauliflower is the most delicate variety of the cabbage tribe. It requires a richer soil and more space than cabbage; and the best crops are obtained from well-manured soil. It will not bear our English winter; it must therefore be protected from frost.

Seed should be sown about August 15 for the production of the earliest crops. The plants should be pricked out in frames and freely exposed during mild weather. The lights

must be placed over them at all times on the approach of frost, and means taken to keep frost from them as the weather becomes more severe. Slugs should be diligently sought after, and decay from excessive moisture during December, January, and February must be kept in check by means of careful ventilation and the judicious use of lime.

The earliest plants may be planted out under hand-glasses at the end of March and early in April, and they will be ready to cut at the end of May or in June, according to the season and aspect.

Persons who have a greenhouse may have nice Cauliflowers only a few days later, and save themselves a large amount of trouble and anxiety, by sowing seed (Early Snowball) in boxes in January, pricking out into other boxes or frames in due course, and planting under hand-lights or on warm borders. Veitch's Early Forcing is a good variety for the purpose. I have cut "heads" in four months after sowing the seed in February.

Autumn Giant is a very fine variety, requiring a long period of growth—four to five months from the time of planting out. The seed should be sown in a frame, if possible, in February, and the seedlings pricked out and encouraged to grow freely. Plant them out at the end of May, or earlier if they can be protected from frost, and they will be ready for cutting in September.

There are other varieties which are ready for use during July and August, but, no matter what variety may be grown, Cauliflowers must be kept growing luxuriantly if good results are desired.

Celery.—The Celery plant grows abundantly and luxuriantly in its wild state by the side of the canal between Droitwich and Salwarpe, in the Isle of Thanet, and other marshy spots of England near the sea. It has been greatly changed by cultivation, and although the plant requires plenty of moisture, yet it is apt to rot in winter in soils saturated with water. A light soil is better for Celery than a stiff soil, and the plant grows better when its leaf-stalks are surrounded with light porous soil than when it is pressed against by that which is heavy and compact.

The earliest Celery is usually grown in single or double rows, six or eight feet apart, as at Sale and Stretford near Manchester ; but equally good Celery is grown later in the season around Tamworth, in broad beds containing twelve rows

in each bed. Under the latter system considerably more sticks of Celery are obtained from the same space of ground. The beds are marked off four, six, eight, or ten feet wide, and as many yards in length as the ground will permit, or as is desired. Six or eight inches only of the top soil are removed to each side of the bed for earthing-up purposes; a heavy dressing of manure is given and carefully forked in, and the Celery is planted nine inches apart in straight lines both ways of the bed.

Three boards, nine inches in width, and as long as the bed is wide, are used to facilitate the earthing-up process. The boards are placed across the bed, and leaning against the Celery plants, each board opposite to the other, and having a vacant space between them. Into this vacant space the two men engaged in the operation, one on each side of the bed of Celery, throw with the spade the soil to be used for earthing-up. One man then slowly and carefully draws one of the boards towards him, whilst his colleague follows it, and carefully places the soil around the plant with one hand, and holds the leaves compactly together with the other hand.

Whether Celery be early or late, two requirements must be supplied at all times if good and crisp Celery is desired, viz., suitable food and sufficient water.

Sow seed in January and February for early crops, and in March and April for late crops. From the time the seed is sown until the Celery is fully grown, the soil in which the plants are should be quite moist. Drought promotes the formation of the flower stem; too much rank manure causes soft and inferior Celery. The former is often produced during the early childhood of the plant; the latter through over anxiety to produce something "big." Give more top-soil to Celery and less subsoil, which is too often the only soil left for it at the bottom of foolishly deep trenches, and there will be available more crisp and nutty Celery.

Cucumbers.—The common Cucumber is very easily grown, either on ridges or mounds in the open air, in frames, or in hothouses. A grower of the ridge variety called "Stockwood" has informed me that the average value is, or has been, 45*l.* per acre, and that he has known them to make as much as 90*l.* per acre. I have had very good crops from an open border, with a south aspect, and without any extra preparation. For this system three or four seeds may be sown in a small pot three inches in diameter, covered with an inch of very light soil, and placed in a warm frame during April. When the

plants are showing above the soil the weaker plant should be pinched off, and the two stronger ones retained. About the middle of May the mounds may be prepared by simply excavating the soil about a foot deep and two feet in diameter, and placing therein some warm manure. The soil should be returned over the manure, and thus form a mound with a hollow middle, and a slight elevation in the exact centre. Upon this slight elevation should be planted the young Cucumber plants, carefully watered, and then covered with a hand-light. A little air-slaked lime placed around, and in contact with, the stem of the plant will do much to prevent death from eel worm and disease. Water must be carefully applied until the plants are thoroughly established, when summer rains often supply all the water they subsequently require. Much depends upon how water is given to Cucumber plants ; it is very important that it should be applied quite up to, but not actually in contact with, the stems of the plants.

Where there is not the convenience of a frame or hothouse for raising the plants seed may be sown directly upon the mounds, and, of course, the whole operation—preparation of mounds and seed sowing—commenced and completed several weeks earlier than previously stated. Protection from frost must be afforded at all times until the danger is past. Rows of broad beans give very valuable shelter, and the crop may be cleared and sold ere the Cucumbers require the whole of the space.

Endive.—Endive is generally known under two forms—the curled and the broad-leaved Batavian. The curled variety has beautifully crimped and curled leaves, which are tender and much esteemed ; the Batavian has leaves nearly flat and is more hardy. The plant is valuable for salad during winter and early spring, but will not withstand a severe winter without injury.

The first sowing should be made about the second week in June, and subsequent sowings in July and August. Sow the seeds in drills six inches apart and not more than half an inch in depth (or it may be sown broad-cast) upon rich soil. Transplant as soon as large enough on to well-manured ground, in rows one foot apart and nine inches apart in the rows. When fully grown each plant should be tied up in a bunch, the outer leaves enclosing the inner leaves and blanching them. Blanching may also be done by placing a tile, flower-pot, or slate over each plant to exclude the light ; a circular object is

best as it gives the plant a tempting appearance with a blanched centre and a fringe of delicate green. On the approach of winter the plants may be lifted and planted closely together in dry cellars, sheds, frames, or greenhouses from which frost is excluded, and from whence they can be taken as required.

Kale.—This has already been described under “Borecole.”

Leeks.—The Leek has long been in favour, and its culture becomes more extended each year. It is very hardy and withstands our winters without injury. As the succulent stem is the part consumed it should be encouraged to grow vigorously by liberal manuring.

Sow seed in the open air as for onions in February or March. Plant out in narrow trenches exactly as for early celery, with plenty of manure. Good Leeks may be obtained by planting them upon the ordinary level of the soil, which has previously had a good dressing of manure. In this case a hole is made to the full length of the dibber, a Leek dropped in, and the hole left unfilled. The plant roots in the soil, grows, and nearly—perhaps quite—fills up the hole.



A
(Stable manure and mixed
chemical manure)

B
(Chemical manure only)

FIG. 7.—Leeks grown in 1902.

Lettuce.—The Lettuce is a smooth annual plant containing a milky and narcotic juice; it has been cultivated from remote antiquity, and is in general use as a salad. The inspissated or thickened juice, known as lettuce opium, is used medicinally to allay pain and induce sleep. Lettuces are a profitable crop to

grow if sent to market early in the season. A variety called "Schofield" (a cabbage lettuce) is popular in some parts, and many acres of similar lettuce are grown in South Worcestershire. The seed is sown in September and the plants are planted out in October in good breadths among the plum trees, from which they receive much protection. They grow slowly but continuously during the autumn and winter, and are ready for use in February, March, and April. The crop sold well in the spring of 1903.

Where very light greenhouses are available, heated or unheated, Lettuce may be grown therein very profitably during the early months of the year if borders of good soil are available. Either Cos Lettuce or Cabbage Lettuce may be grown, but the former commands the highest market price. It should be remembered that good Lettuce must be tender, and tenderness and crispness can only be obtained by luxuriant growth, hence the necessity for rich soil and a warm atmosphere.

A pinch of seed sown in January under glass, and the young Lettuce planted in February as suggested above, will produce good and tender Lettuce for use in March and April, and I have grown and sold Lettuce under those conditions at that season for three-halfpence each.

The growth of Lettuce for summer use is so well understood that it requires no description.

Mushrooms.—The common Mushroom (*Agaricus campestris*) is considered to be one of the most savoury of the genus, and is in much request for the table. The St. George's Mushroom (*Agaricus arvensis*) and the Fairy-ring Mushroom (*Marasmius oreades*) are also very delicious, though not quite so delicate in flavour.

Mushrooms are cultivated in sheds specially built for them, in spare sheds and outbuildings, in cellars, on ridges in the open air, and in fields. Whether they are grown in all or any of the four first mentioned ways, the preparation of the manure and the other details are almost identical.

Manure from corn-fed horses is essential to the greatest success, and it is not very material whether straw or peat moss has been used as bedding for the horse or horses. Maiden spawn should be used if possible ; and of course it should be living and vigorous. The temperature of the air in which the Mushrooms have to grow should be as uniformly as possible about 60° F., and the bed should be in darkness and in a moist atmosphere.

Collect the manure as fresh as possible, and reject any long straw which may be present. Spread the manure in a dry place to a foot in depth and turn it over several times to get rid of superfluous moisture ; but allow it to be slightly moist. Then throw the mass into a heap to promote fermentation. Turn the heap over again on the second day, and in two more days the manure will be ready for forming the bed.

For all artificial methods of Mushroom culture the preparation of the bed is the same ; that is to say, the manure should be spread in layers over the area allotted to the bed and made quite firm. If a flat bed, no matter what the area covered, it should be a foot in depth when the whole bed has been made quite firm and completed. If the Mushrooms are to be grown on ridges out of doors, the ridges ought to be three feet six inches wide at the base and about three feet high.

In several days the manure will reach its maximum temperature, which may be a little over or under 100° F. If under 100° the bed may be at once spawned ; if over 100° it had better wait until it has fallen below that degree of heat. Then take the fresh spawn, break it into pieces about two and a half inches square and insert them (with the "grain" horizontal) just below the surface of the manure at intervals of six or seven inches all over the bed or ridge. The whole surface should then be again beaten down with a brick gently but firmly. In a few days the spawn will be seen to be growing and extending in all directions, and the bed or ridge should then receive its "casing" or "coating" of soil. The soil should be quite one inch in thickness after it has been beaten down firmly and smoothly with the back of a clean spade.

Cover the bed or ridge over with hay, and if the ridge is out of doors apply a nice coating of straw or long litter over the hay. Then wait with patience and confidence for the crop which is assured if all the foregoing conditions have been complied with.

Mushrooms may sometimes be established in pastures by taking up a spadeful of turf here and there, making a hole and inserting a forkful of manure, adding a piece of spawn at the top and relaying the turf. When the desired crop makes its appearance in a pasture it should be encouraged to remain and to spread by annual dressings of salt, and by allowing a few Mushrooms at intervals all over the pasture to grow to full

maturity, and to spread their myriads of dark seeds (spores) all over the field.¹

Onions.—The Onion is entitled to rank amongst the oldest of cultivated vegetables. It has a wide geographical distribution. A good crop of Onions is one of the most profitable of vegetables, and is worth from 40*l.* to 60*l.* per acre. An average crop would be about 10 tons per acre, but that is sometimes doubled, and as the price of Onions usually varies between 3*l.* 10*s.* and 4*l.* 10*s.* per ton its value as a market garden crop is easily estimated.

Onions appear to be more successful when grown upon light soil than upon very heavy and clayey soil. I have frequently grown crops at the rate of 15 tons to 23 tons per acre upon the former, but never upon the latter. For the above-mentioned crops the ground should be dug thoroughly from ten to twelve inches in depth, and stable manure should be applied at the rate of 20 tons per acre. The soil is thrown up roughly and left to the action of the weather for several weeks. It is then worked over with the fork or the harrow, and pulverised and levelled down for reception of the seed.

Early in March, before the middle of the month, if possible, the seed is sown in drills one foot apart, and at the rate of 14 lb. per acre; and if the soil is very light it is gently pressed over the seed after the seed is covered. Nothing more is done until

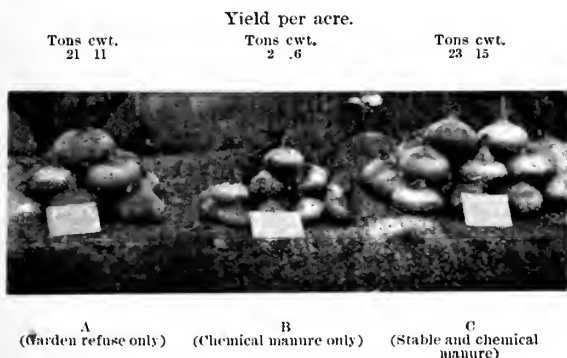


FIG. 8.—Onions grown in 1902.

¹ For further particulars as to the cultivation or identification of Mushrooms, the reader is referred to the following: *How to Grow Mushrooms: a popular explanation of the best method of culture*, by William Earley (Bradbury, Agnew & Co.); *Tableaux Synoptiques des Champignons Comestibles et Vénéneux*, par Charles Manget, Paris, 1903; *Mushroom Culture for Amateurs*, by W. J. May (L. Upcott Gill), London, 1900.

Sown March, 1903. Yield, 9 tons per acre.



FIG. 9.—Onions, "Rousham Park Hero."
(Mixed chemical manure only)

Sown March, 1903. Yield, 25 tons per acre.



FIG. 10.—Onions, "Rousham Park Hero."
(Manured with garden refuse only)

Sown March, 1903. Yield, 26 tons per acre.



FIG. 11.—Onions, "Rousham Park Hero."
(Stable manure and mixed chemical manure)

the plant shows itself clearly in lines, then the hoes are set to work and no weeds, large or small, are tolerated until the crop is harvested.

At the end of May and early in June the Onions are ready for thinning. This is effected by hand, and the plants are left at not more—frequently at less—than three inches apart. When the bulbs of the Onions meet in a straight line they move slightly to either side where there is abundance of space, and the result is a large crop of useful-sized Onions averaging three to three and a half inches in diameter.

A few Onions are annually sown in July for producing bulbs of a very large size for use in the following summer ; but as knowledge extends it is found that as fine bulbs are obtained from seed sown under glass in December and January, and this course is becoming the more popular. The latter are sown in pots, boxes, or pans under the conditions mentioned, and are planted out of doors early in April upon very rich soil, and at nine to twelve inches apart in the rows. Bulbs of this kind may be grown weighing from a pound and a half to nearly three pounds each.

The preceding illustrations (Figs. 8 to 11) show Onions as cultivated respectively with garden refuse as the only manure, with chemical manure only, and with stable and chemical manure. The photographs of Figs. 9 to 11 were taken on September 9, 1903.

There is a large demand for pickling Onions, but our Continental neighbours have paid special attention to this branch of Onion culture and have the market very much in their own hands.

Many acres are annually grown for pulling as young onions during the early months of the year, when our appetite is craving for something green and uncooked. Sometimes this crop pays very well; sometimes the markets are glutted, and the crop entails a loss. I think it should be looked upon rather as a catch crop than as a main crop. Sow the seed thickly in drills in July, and do not promote too luxuriant growth, lest an ordinary winter destroy the crop.

Parsnips.—The Parsnip is one of the easiest of vegetables to cultivate, is a good auxiliary to our winter supply of food, and is sometimes a profitable crop. Seed may be sown from the middle of February to the middle of March, but in case of failure of the first sowing the middle of April is not too late, and seed sown then may yield a fair crop. Deep culture is necessary for the production of the heaviest crops of the finest roots, and my remarks thereon in regard to beet and carrots apply with the same force to parsnips. The seed should be sown in drills fourteen inches apart, and the plants thinned to seven or eight inches apart. If extra fine roots

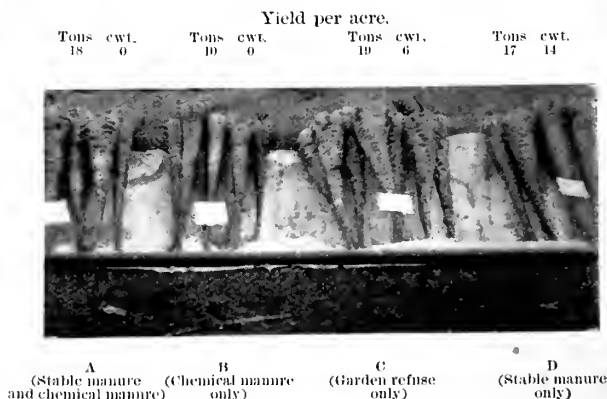


FIG. 12.—Parsnips grown in 1902.

are desired three inches more space must be given to them. Eighteen tons per acre is a good average crop, but a crop like that does not pay when the price is 15s. per ton.

Peas.—Peas, as a rule, are not a very profitable crop, but as they are on the ground only about five months—February to July for early Peas, and April to September for the main crop—they can be charged only for six months' rent and labour, and they are at once succeeded by other and possibly better crops in the way of cabbage or swedes.

In regard to manuring, Peas appear to support the theory of the non-application of nitrogen, as regards those varieties which are required to produce and ripen a crop all at once ; but I doubt if the same applies to those varieties which grow five to eight feet in height, and produce a long succession of pods. One thing is quite clear as a result of five consecutive years' experiments—chemical manures alone do not produce as good a result, as stable manure only, garden refuse only, or of stable manure supplemented by mixed chemical manures.

The earliest Peas are usually sown in a warm position at the beginning of November. The next in earliness are sown in January and February, to be followed by others in March, April, and May.

Potatoes.—Potatoes require potash, phosphoric acid, and nitrogen for the formation of perfect tissue, without which there cannot be abundant crops of sound and well-flavoured tubers. Under a system of high culture on suitable soil it is comparatively easy to obtain from 15 to 18 tons of potatoes per statute acre. The best average results are obtained from the application of farmyard or stable manure at the rate of about 16 tons per acre, supplemented by 3 cwt. of bone meal and 2 cwt. of sulphate of potash ; or by 5 cwt. of superphosphate of lime, 2 cwt. of nitrate of soda and 2 cwt. of kainit. The animal manure should be turned in a short time previous to planting. Then shallow furrows should be thrown out with the plough, or drawn with a heavy hoe, the selected fertiliser applied to each furrow, the Potatoes planted and duly covered in.

The common practice of planting the tubers in direct contact with animal manure is to be deprecated. My experience tends to show that tubers thus planted are apt to deteriorate and are predisposed to disease.¹ The "dibbing in"

¹ For notes on the potato disease see page 104.

of Potatoes by means of a setting-peg is also objectionable, especially on stiff or wet soils.

Potatoes for "seed" should be carefully selected from the stock at lifting time. The tubers should be well shaped and should weigh between two and three ounces each. Many experiments have demonstrated that smaller or larger "seed" are not so productive as those of the size recommended. Moreover, experiments have shown that large tubers when cut into several pieces do not produce such good results as whole tubers of the size mentioned.

Seed Potatoes should be stored in a cool, light, and frost-proof place. If it is possible to accommodate them in single layers, so much the better. Nests of trays are now much in use for storing seed; they are portable, and the Potatoes can be examined and moved from place to place with ease and safety. And as the trays can be arranged one above another to almost any height, it is obvious that a large quantity of seed can be perfectly stored by such means in a comparatively small space.

If an earlier growth is desired, the trays may be removed to a warmer place; a little fine soil should be sprinkled over the Potatoes, which should then be slightly watered. In a short time each Potato will send forth a large number of rootlets into the moist soil; they should then be duly planted out without receiving any check. This is a simple and effective way of helping forward the crop of early Potatoes.

Where the soil is mechanically suitable for the cultivation of the Potato, but chemically deficient, as in some places in the centre of Worcestershire, I think there can be no doubt that a change of "seed" is not only advisable commercially, but is almost compulsory if satisfactory crops are to be obtained. Some soils are suitable in every way for the growth of the Potato, and then a "change of seed" is neither necessary or desirable, provided a variety has been found which suits the soil. We hear and read much about the natural deterioration of varieties of Potatoes, but why has not Myatt's Early Prolific Ash-leaved Kidney disappeared because of deterioration? That variety is not specially vigorous, yet it is still with us and is as much alive as it was many years ago. It was first raised about the year 1850.

Early Potatoes are more profitable than late Potatoes, and very good crops are generally obtained—crops varying from 8 tons to 12 tons per acre—from such early varieties as Sutton's

Ringleader, Sharpe's Victor, Early Puritan, Webb's Express ; and as these varieties realise an average of 7*l.* per ton, I think they may be considered as satisfactory.

Potatoes for digging early do not require so much space for development as late and stronger-growing varieties ; and twenty inches from row to row and fifteen inches from plant to plant in the row is sufficient to produce good crops, provided that the hints at the commencement of this subject are put into practice.

Radishes.—Radishes are usually a good paying crop if obtained early, and if the roots are tender and juicy. The soil should be richly manured either with animal manure (which is best) or with four parts of superphosphate of lime, two parts of nitrate of soda and one part of kainit. The mixture should be applied at the rate of 6 cwt. per acre. The seed should be sown in December in a sheltered position, and covered up with straw until it has germinated and the young plants appear, when the straw must be removed in the morning by means of a wooden rake for the admission of light, and again replaced in the evening to protect the plants from frost. Shelter from the north and east winds should be provided if possible. Later crops are obtained from seed sown in more open positions in January and February. Sow the seed broadcast, rake it in, and protect from birds by all possible means.

Rhubarb.—This is a most useful crop for home use, and a very profitable one when properly grown and marketed. Its value varies from 20*l.* to 60*l.* per acre.

Sow seed in March in drills one foot apart, and when the plants are large enough to handle in their seedling stage thin them out to nine inches apart in the rows. These seedlings may be transplanted to their permanent position during the following winter, the ground having been previously well manured and deeply cultivated for their reception. Plant in rows four feet apart, with the plants three feet apart in the rows.

Old roots may be divided and replanted by cutting them in pieces with one or more buds to each. They should be planted four feet by three feet apart.

Rhubarb is easily forced by lifting the roots entirely from the ground and planting them closely together in a dark shed, cellar, or mushroom house, filling the interstices between the roots with soil and giving a thorough watering with water at 90° F. A mean atmospheric temperature of 60° F. suits Rhubarb admirably. It is also considerably accelerated in

growth in the open ground by placing large pots, barrels, or boxes over the crowns and covering the whole with fermenting stable manure and litter.

Salsify.—Salsify is a native plant, and is sometimes found growing in wet meadows. It is occasionally cultivated as a vegetable in this country, but much more extensively on the Continent. Its cultivation is very simple : sow seed in April on ground prepared as for carrots or parsnips ; sow it in drills fourteen inches apart and an inch in depth ; thin out the plants to six or seven inches apart. When fully grown the roots may remain in the ground like parsnips, and be used as required ; or they may be taken up and stored like beet or carrots.

In cooking, the roots should first be washed, then parboiled and the skin removed, after which they should be boiled in milk until quite tender.

Scorzonera.—Though of a different genus the cultural and culinary details are the same as for salsify ; there is not much demand at present for either plant, but it is impossible to say how long their unpopularity will continue. It is not many years since a few hundredweight of tomatoes supplied the requirements of the whole country ; to-day the demand is for as many hundreds of tons.

Spinach.—The culture of Spinach is so simple that it requires little explanation. It is usually sown between rows of early peas ; but it is more luxuriant when grown in breadths by itself. Sow in drills fifteen inches apart, and as often as the demand necessitates. The crop which has to stand through the winter should be sown about the end of August ; but as a mild autumn would cause it to be too tender to withstand severe weather another sowing should be made in September. The plants should be thinned out to six inches apart, but the summer crop need not be thinned, because it is not required to be so hardy, and the entire plant is cut when gathered for use.

Seakale.—Seakale is a hardy perennial, growing naturally on the coasts of England and Scotland. This plant merits a wider culture, being a delicious vegetable and profitable to grow. It requires a porous but rich soil ; cold and wet soil causes the roots to decay. I have sold early forced Seakale at 2s. per pound, and outdoor grown and blanched at 3d. per pound ; and I have cut "heads" from single crowns weighing over sixteen ounces each. A good plantation of Seakale not

forced, but cut from the open ground, is worth about 40*l.* per acre. When forced it is worth considerably more ; but the expenses of forcing have to be taken into consideration.

It can be grown either from seed or root-cuttings. Sow seed in March or April in drills two feet apart, and when the plants are several inches above the soil thin them out to fifteen inches apart. These seedlings require a second year's growth before they are capable of producing really good Seakale. After their second year of growth they are suitable either for lifting and forcing, or for blanching and cutting where they have grown.

By growing Seakale from root-cuttings a year is saved. Very strong plants are produced in one year. Cuttings from old plants are prepared by selecting roots from half an inch to three-quarters of an inch in diameter and about five inches in length. The end (the thickest) nearest the main root is cut straight across and the other end is cut in a sloping direction ; this should be done at the moment of making the cutting in order to distinguish one end from the other, and that they may be planted right end upwards. To avoid the possibility of having gaps in the plantation the cuttings should be tied in bundles of any given number and buried in soil several inches until growth buds have formed at the top end of the cuttings ; this usually brings us to the end of April or beginning of May.

Plant the cuttings with a dibber, leaving the top of each cutting about one inch below the surface of the soil, and plant them at distances apart according to the purpose for which they are grown, *i.e.*, firstly, for lifting and forcing entirely ; secondly, for growing and cutting from the open ground ; thirdly, for both these methods combined. In the first case the cuttings may be planted in rows two feet apart ; in the second case they must be planted in rows three feet apart ; and in the third case they may be planted in rows twenty inches apart—every alternate row to be lifted for forcing, and the others to be covered with soil from between the rows to a depth of nine or ten inches ; this blanches the Seakale during its growth the following April. When the outdoor Seakale is all cut the roots should be carefully cleared from the ground and a new site given to the next year's crop.

Turnips.—The Turnip is a hardy biennial ; its root is hard and woody in the wild state, but cultivation has converted it into the useful vegetable it is, though bad cultivation and

unsuitable conditions allow it to revert at once to its uncultivated state: hence frequent failures in gardens. Success in the culture of Turnips depends mainly upon an abundant supply of manure and water. Turnips realise prices varying from a shilling to four shillings per bushel, consequently it is sometimes a very profitable catch crop. Early Turnips are usually the most profitable, and if Early Purple-top Milan is sown upon good soil in April there is usually a good crop for sale therefrom early in June. The same variety also produces good results when sown in July or August. Early Snowball and Model White Stone are very good mid-season varieties.

Tomato.—The Tomato is a wholesome and medicinal fruit, very prolific, and easily cultivated. It is closely allied to the potato, and may be successfully grafted upon it. Like the potato, it does not thrive in a low temperature or a wet soil, but prospers in warm and fresh air and in soil moist, firm, yet friable. Tomatoes grow well and ripen fruit in the open air in warm districts, and when planted against walls, sheds, and wooden fences they are generally successful. But the greatest success is achieved when they are grown in suitably constructed glass houses, which should admit a maximum of light and of fresh air under the control of the cultivator. If such houses are fitted with sufficient hot water piping to maintain a mean temperature of 55° F. in winter and 68° F. in summer they will be perfect houses for the purpose. Given such glass structures and intelligent management, there are few, if any, crops more profitable.

Tomatoes are also a profitable out-door crop in favourable seasons: but in unfavourable seasons like that of 1903 there is a large element of risk and uncertainty. Whether they are grown under glass or in the open air the same fundamental principles of successful cultivation apply in each case: the plants must be grown robustly from the germination of the seed to the ripening of the fruit. Sturdiness is obtained by supplying food, air, and light in abundance, and warmth to the required extent.

Whether for early crops or main crops the seed should be sown thinly—about an inch apart is correct. When the seed germinates, and the young plants appear above the soil, they are not overcrowded. When the second rough leaf appears they should be transplanted into boxes or small pots, and kept growing within a foot or eighteen inches of the glass. In two or three weeks they will be ready for placing in pots

five inches in diameter, and for preparation either as plants under glass or in the open air. The plants should be kept clear of each other, allowing each leaf to receive air and light without obstruction. In a fortnight they will be ready for planting out, provided that they have received abundance of fresh air. Those to be planted out of doors are better for being inured to it by being placed in a sheltered position in the open air for a few days. By the end of May or beginning of June those plants intended for the open air culture will have at least one bunch of fruit "set" thereon, and no matter if the season is a bad one, that bunch of fruit is practically certain to ripen in due time, and so pay for the cost of culture—one bunch of ripe fruit gathered and sold at a fair price being sufficient to do that.

Plant out at the end of May or beginning of June, according to season and district, in rows four feet apart, and the plants three feet apart in the rows. They may be kept either to single stems, or three or four stems or branches may be allowed to grow, the latter producing the larger weight of fruit.

If grown under glass the plants ought to be planted in the soil, which should contain a good supply of lime, at near the ordinary ground level, and be trained vertically up to the roof; better results are obtained in this way than by training the plants near the glass and parallel to the roof. A free circulation of fresh air should be supplied to these plants at all times from May to the end of September inclusive, and water should be applied in sufficient, but not over-abundant, quantity, always keeping the soil moist and sweet, and not wet. Incorrect ventilation and watering are responsible for nearly all the attacks of disease upon the foliage of Tomatoes under glass.¹ In conclusion, I must offer a word of caution about the removal of foliage: do not remove many leaves if you must remove any, and cut away only those, or parts of those, which are absolutely necessary. The destruction of foliage from any cause weakens a plant and checks the development of fruit.

Vegetable Marrow.—This plant is so well known that it requires no cultural details, but if planted more frequently on the ordinary border of the garden more fruit would be obtained. Good crops are worth from 20*l.* to 30*l.* per acre.

¹ For notes on tomato diseases see page 101.

LIST OF VARIETIES OF THE VEGETABLES DESCRIBED.

The following list may be helpful to some readers, who are embarrassed by the large number of varieties mentioned in many seed catalogues:—

ASPARAGUS: Connover's Colossal, Palmetto. BEET: Dell's Crimson, Pragnell's Exhibition. BEANS: Broad—Bunyard's Exhibition; French—Magnum Bonum, Canadian Wonder; Runner—Neal's Ne Plus Ultra, Painted Lady. BROCCOLI: Improved Curled, Cottager's Kale. BROCCOLI: Veitch's Self-Protecting, Leamington, Tamworth, Ledsham's Latest of All. BRUSSELS SPROUTS: President Carnot, Covent Garden, Imported. CARROT: James's Scarlet Intermediate, Guerande, Early Nantes. CABBAGE: Early Offenham, Wheeler's Imperial, Drumhead Savoy, Red Dutch. CAULIFLOWER: Early Snowball, Early London, Veitch's Autumn Giant, King of Cauliflowers. CELERY: Leicester Red, Yates' Excelsior Pink, Wright's Grove White. ENDIVE: Improved Green Curled, Moss Curled. LETTUCE: Cabbage—Schofield's Winter White, Tom Thumb, Champion; Cos—Champion White Cos, Balloon Cos. LEEK: The Lyon, Musselburgh. ONION: For sowing in March—Rousham Park Hero, Bedfordshire Champion, Veitch's Main Crop; For sowing under glass in December or January—Ailsa Craig, Cranston's Excelsior. PARSNIP: Elecombe's Improved, Student, Hollow-crowned. PEAS: Early—Eclipse, William Hurst, Gradus; Main crop—The Stanley, Sharpe's Queen, Telephone, Veitch's Perfection, Ne Plus Ultra. POTATOES: Early Kidney—Sharpe's Victor, Sutton's Ringleader; Late Kidney—Reading Giant, British Queen; Early Round—Early Regent, Early Puritan; Late Round—Up-to-date, Windsor Castle. RADISH: Wood's Early Frame, Ne Plus Ultra, Turnip (white and red). RHUBARB: Myatt's Victoria, Early Scarlet, Johnstone's St. Martins. SEAKALE: Lily White, Ordinary Purple. SPINACH: Improved Victoria Round Seeded, Prickly Seeded. TOMATO: Early Evesham, Chémín Rouge, Early Ruby, Challenger. TURNIP: Early Milan Purple-top, Early Snowball, Green-top White Stone. VEGETABLE MARROW: White and Green Bush, Long White and Long Green, Moore's Cream.

MANURIAL EXPERIMENTS WITH VEGETABLES.

Details as to manuring have already been given; but it may be of further interest if I add the results of experiments in the manuring of various crops during a period of five years. These experiments are being conducted at the Worcestershire County Council Experimental Garden at Droitwich, and they consist of two series. (1) Four plots manured with (a) stable manure alone; (b) mixed chemical manure alone, consisting of mineral superphosphate of lime, kainit, nitrate of soda, sulphate of ammonia, sulphate of soda, sulphate of magnesia, and sulphate of iron; (c) garden refuse only; and (d) stable manure supplemented by mixed chemical manures. (2) Four small plots manured only with one kind of chemical manure, viz., nitrate of soda, kainit, sulphate of ammonia, and mineral superphosphate of lime.

An analysis of the soil of the first four plots mentioned, made by Mr. Cecil Duncan, County Analyst for Worcestershire, in August, 1903, shows that the plot most highly

manured with stable manure, supplemented by mixed chemical manure, contained the largest amount of available plant food. This was followed in order of merit by the plot receiving mixed chemical manure only, the plot receiving stable manure only, and the plot receiving nothing but garden refuse.

The resulting crops from the various plots do not correspond with the amount of available plant food present in the soil, as may be seen by the following Table, giving the yields in quantities per acre:—

	Stable and Chemical Manure		Stable Manure		Garden Refuse		Mixed Chemical Manure		
	T.	c.	T.	c.	T.	c.	T.	c.	
Potatoes (Myatt's)	10	15	9	15	9	7	6	5	} Average for 4 years
Parsnips	19	0	17	17	15	15	8	16	
Beet	25	10	21	14	19	14	19	16	
Onions	17	2	16	9	17	18	6	10	} Average for 5 years
	Bushels		Bushels		Bushels		Bushels		
Peas (Wm. Hurst).	216		196		213		143		} Average for 5 years
Broad Beans . . .	382		379		382		280		
Runner Beans . .	285		259		262		150		} Average for 4 years
	Sulphate of Ammonia		Nitrate of Soda		Kainit		Super-phosphate of Lime		
	T.	c.	T.	c.	T.	c.	T.	c.	
Potatoes (Express)	4	8	4	10	4	10	3	15	} Average for 4 years
Onions	2	6	3	12	6	0	1	15	
Carrots	13	18	13	11	21	5	12	17	
Parsnips	3	8	5	2	7	1	5	0	
Beet	17	10	18	6	28	7	15	16	
	Bushels		Bushels		Bushels		Bushels		
Peas (Wm. Hurst).	98		108		214		126		
Runner Beans . .	91		112		213		122		
Broad Beans . . .	167		120		256		164		

The first part of the Table indicates the value of garden refuse as a source of plant food, and the unsatisfactory nature of the chemical manures used alone. The second part of the Table places kainit and nitrate of soda in a favourable light.

INSECT AND OTHER PESTS.

An article upon the cultivation of vegetables would be incomplete without any reference to those things which may easily destroy, if neglected, the results of the greatest care and the highest culture. Although general rules for their prevention and destruction may be given, each case has to be dealt with on its own merits. Usually, prompt attention

and determination to eradicate a pest are followed by success, but that success involves much labour and persistent effort.

Asparagus Beetle (*Crioceris Asparagi*).—Much damage is annually wrought by this pest and its larvæ. Unfortunately it is too frequently neglected under a mistaken impression that it is difficult to combat. It is one of the easiest to destroy of all plant pests within my knowledge. An intelligent and industrious boy or girl will catch nearly the whole of the brood in one season over a large area of ground if they commence soon enough. Let each boy or girl be supplied with a small tin cup or mug in the bottom of which is about one inch of gas tar, and as the asparagus commences to grow let each shoot be inspected and the beetle quietly shaken into the tar as the cup is held beneath. Examinations daily, or twice daily, during the month of May will quickly rid a plantation of the pest.

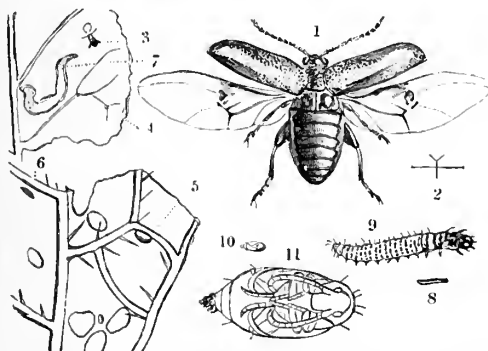
Anbury, or "Finger-and-Toe" (*Plasmiodiophora Brassicæ*) is a diseased swelling of the root, affecting turnips, cabbages, cauliflowers, and other cruciferous plants. The spores enter the roots probably through the root hairs and commence to battle with the living protoplasm of the cells for possession. This struggle acts as an attractive force on the supplies of available food coming from the leaves, and the cells consequently become gorged; in the end these increased supplies of food go to the benefit of the conquering *Plasmiodiophora*. The plasmodium is able to pass from cell to cell devouring their contents, and gaining in size and strength at their expense. The swellings become larger and larger, and the whole energies of the plant are exhausted in paying heavier taxes to its relentless foe. The plasmodium breaks up into extremely minute clumps of protoplasm in the cells, when each surrounds itself with a membrane and becomes a spore. The spores remain in the root until it decays, when they are set free in the soil ready to germinate the following spring. Sourness of soil and deficiency of lime are conducive to this disease, and the application of lime is one of the best remedies to employ.

Large White Cabbage Butterfly and Cabbage Moth.—The caterpillars of these seriously injure the cabbage crop; and when the eggs are laid from which they hatch there is no practical method of dealing with them. There are usually two broods from each—one in May and one in August. Acting on the principle that prevention is better than cure, I pay a penny for every twelve white butterflies brought to me in May or June and caught upon the ground I cultivate, and I have been well satisfied with results.

Beet Fly and Celery Fly.—Two or more broods of these pests are liable to work great damage among the crops. The eggs are laid between the upper and lower surfaces of the leaves and the parent fly dies. The eggs hatch and the maggot feeds upon the inner substance of the leaves, which present a blistered appearance. Usually it is easy to deal with the first attack of the celery by squeezing each maggot between finger and thumb, because they are few; but if the first brood is neglected they arrive at maturity and deposit eggs in their turn tenfold, and the task of the celery grower is then difficult. Rows or beds of celery may be protected by dusting soot evenly over the foliage, or by spraying the plants with an emulsion of petroleum. I prefer “pinching” and “sooting.” If large breadths of beet or mangels are attacked with the larvæ of the fly, it is good policy to apply a stimulating manure and induce the crop to outgrow the attack.

Onion Fly and Carrot Fly.—Maggots which are so destructive to onions and carrots may easily be prevented by dusting the crops evenly with soot, and repeating the operation as often as is necessary until the egg-laying period is past. When the flies approach onions or carrots for breeding purposes and find them looking black and objectionable they seek other beds more to their liking. When a crop of onions is attacked by the maggots an application of salt is beneficial.

Turnip Fly or Flea Beetle.—This insect feeds on the leaves of young turnips, and especially the leaves of seedlings. The



1 FIG. 13.—Turnip Fly, *Phyllotreta (Haltica) nemorum* (Coleoptera).

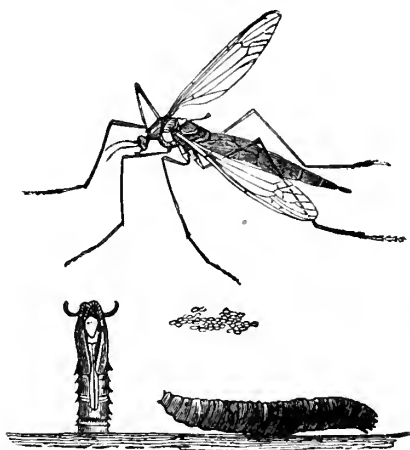
1, Mature beetle, magnified; 2, 3, Natural size. 4, 5, Eggs laid on under surface of rough leaf. 6, 7, Burrows in leaf, made by larvæ or maggots. 8, Larva, natural size; 9, Magnified. 10, Pupa or chrysalis, natural size; 11, Magnified.

¹ Reproduced from the Society's Text-Book, "Elements of Agriculture."

female lays its eggs on the underside of the rough leaves, and the larvæ, when hatched, burrow into the leaves. The fly is capable of causing much mischief, especially in dry seasons. The best practical way of dealing with the pest is to promote rapid growth of the plant by the application of a stimulating manure. Bush-harrowing is also very effective; and a fine spray of an emulsion of paraffin is at once destructive and deterrent. When the turnips are grown upon a small scale, mischief may be prevented by the application of soot, lime, fine soil, or spraying with various insecticides.

Cabbage Root Fly.—The fly deposits eggs in the stem of the young cabbage or cauliflower near the ground. This is often done while the plants are in the seed bed. The eggs are hatched in a few days, and the maggots eat their way into the root, often killing many of the plants. Soot or lime should be dusted over the plants when they make their first rough leaf as a preventive measure; a subsequent dusting will help to keep the fly at bay and make the plants safe. High earthing-up will partly save a crop, by inducing the formation of roots from joints above ground.

Leather-jacket.—This is the larva of Daddy-long-legs or Crane Fly. The flies should be destroyed if practicable. Starlings diligently search for the maggots and feed on them. Frequent hoeings bring the maggots to the surface of the soil and expose them to their natural foes.



¹ FIG. 14.—Daddy Longlegs. *Tipula oleracea*. (Diptera), with eggs, grub (leather-jacket), and chrysalis.

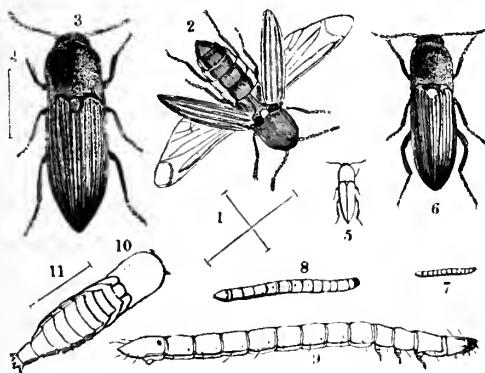
Pea and Bean Weevil.—Seed peas and beans often contain the perfect weevil alive at the time of sowing the seed, so that even if the soil be free from the pest it may be easily introduced. Some seedsmen pass their seed through a process which destroys the weevils. In 1901 sparrows cleared the weevils from my peas

and did not touch the growing plants. Many remedies have been suggested, but I know of nothing to deal effectually with

¹ Reproduced from the Society's Text-Book, "Elements of Agriculture."

them. Doubtless the wisest policy is only to sow seed that is free from the pest.

Wireworm.—This scourge to the cultivator of the soil exists as the wireworm for four or five years, then changes into the pupal state, and in due course emerges as the perfect beetle (Click Beetle). There can be no doubt that good cultivation of the soil does much to reduce the number of wireworms present. If this is supplemented by baiting with rape dust where necessary, and by dressing affected crops with rape meal manure, the pest may be effectively dealt with. Baiting is very useful, and even necessary, where the ground is occupied by a permanent crop like hops. A handful of rape dust will



¹ FIG. 15.—WIREWORMS AND CLICK BEETLES, *Elater* sp. (Coleoptera).

2, *Elater lineatus*, magnified; 1, Natural size. 3, *Elater obscurus*, magnified; 4, Natural length. 5, *Elater sputator*, natural size; 6, Magnified. 7, Larva of *E. sputator* (?). 8, Larva of *E. lineatus*, natural size; 9, Magnified. 10, Pupa of wireworm, magnified; 11, Natural length.

attract many of the wireworms if it is buried slightly below the surface of the soil, where its presence should be marked by means of a stick to facilitate the work of collecting the pests. These baits should be placed at intervals of a few feet apart all over the affected area, and examined every two or three days. The wireworms may thus be collected and destroyed. I have repeatedly saved crops of carrots from destruction even when it appeared a forlorn hope, by the application of such a manure; and if the wireworm will leave carrots for it, what will they not leave? Rolling the soil also acts as a check upon the pest.

¹ Reproduced from the Society's Text-Book, "Elements of Agriculture."

Potato Disease (*Phytophthora infestans*).—This disease requires moisture for the growth of the spores lying on the leaf of the potato. Copper sulphate is poison to the growing spore, hence the benefit of spraying with a solution of this substance. The disease is spread by the very minute spores of the fungus floating in the air and carried about by the slightest wind. The conditions under which the disease appears are the saturation of the warm atmosphere in the late summer or autumn with water from heavy rainfall, and the liberation when the temperature slightly falls of a portion of the moisture as dew on the potato leaf. This is sufficient to cause the spore to germinate. When the delicate tube emerges from the spore it is killed if the leaf has been sprayed with copper sulphate, hence the great benefit of spraying with dilute Bordeaux mixture, consisting of 10 lb. of copper sulphate (blue stone) and 8 lb. of freshly slaked lime to 100 gallons of water. The blue stone should be dissolved in warm water and the dissolved lime should be added, additional water being poured on the lime until it is all taken up, and then the whole may be made up to 100 gallons. Wooden vessels should be employed in these operations. The mixture should be used as soon as possible after it has been made, as it deteriorates by keeping. Where disease has already obtained possession of the foliage, the tubers may be saved by moulding up to a greater depth, and by cutting off the haulm, and leaving the tubers in the soil until mature. If the tubers have just "set" their skins I have found it good policy to lift the crop and store them away.

Tomato Diseases.—The tomato is chiefly affected by three diseases which attack the leaf, the stem, and the fruit. Plants growing in a stagnant and comparatively cold atmosphere, and having too much water at the roots, suffer most from attacks of leaf disease. A warmer temperature and freer circulation of air, with less water at the roots, will check the spread of the disease. When the disease first makes its appearance look to the above details and correct any defect, and at once sponge the affected leaves with a solution of sulphide of potassium (lime of sulphur) in the proportion of half an ounce to three quarts of water. An occasional subsequent spraying with the same mixture will hold the disease in check.

Another disease (*Fusarium Lycopersici*) affects the stem of the tomato, and causes the plant to collapse entirely. Directly this is detected remove the plant bodily with the soil in which it is growing and burn the whole. Fill up the hole with

fresh soil, containing a goodly proportion of lime, and plant afresh.

The third disease (*Cladosporium Lycopersici*) is a dark-brown spot upon the green or ripe fruit. At first it is exceedingly small, but it soon increases in size, and spoils the fruit. Drastic measures must be adopted, and the affected fruit picked off and burned. The disease propagates itself rapidly by spreading innumerable spores all around. Spraying the plants when in flower with the solution of sulphide of potassium is said to arrest the spread of the disease. Wherever it has once been, if under glass, the glass and woodwork should be washed, the wall lime-washed, and the soil removed. All living things, plant and animal, should be removed from the house, and it should be filled with strong fumes of burning sulphur. A fresh site should be given to outdoor tomatoes, and caustic lime freely applied to the old site.

JAMES UDALE.

Droitwich.

THE AGRICULTURAL EXPERIMENTS OF THE LATE MR. JAMES MASON.

MR. JAMES MASON, of Eynsham Hall, Oxon., one of the original founders of the firm of Mason and Barry, carried on an extensive series of agricultural experiments for the last twenty years of his life. While some of the work was on a laboratory scale, everything was intended to bear directly on practice, and the information gained was applied to ordinary farming conditions on the estate. Mr. Mason himself published little or nothing about his procedure; he contributed a short article to this Journal (Vol. 53, 1892, pp. 651-657), and some of his methods were set out by Professor Wrightson and Mr. S. B. L. Druce in the *Agricultural Gazette* for 1891 (Vol. 34, pp. 240 and 445). Most exact and ample records were kept, however, of everything that was done, and the present paper is simply an attempt to extract the main results, scientific and practical, which possess permanent value. In addition to Mr. Mason's papers I have been allowed by Lady Gilbert's kindness to read the correspondence which for many years passed between him and the late Sir Henry Gilbert.

Mr. Mason's early life was engrossed in business, a business, however, in which the applications of science to industry found the fullest scope; he was much occupied with the chemistry of the various processes for the recovery of copper, and it was to a rare combination of scientific aptitude with energy and organising power that he owed a success which would probably have been equally marked in any other walk of life. Although Mr. Mason purchased the Eynsham Hall Estate in 1867 it was not until 1882, after his withdrawal from active participation in business, that he began to turn his attention to agricultural matters. At that time the greater part of the estate was let, only the park and a few recently acquired

arable fields being in hand. But the agricultural depression culminating in the disastrous season of 1879 was then beginning to make itself severely felt, and as tenant after tenant either failed or threw up his holding to avoid worse loss Mr. Mason took the farms in hand, until from 600 acres or so of pasture he grew into farming about 1,800 acres, of which about 800 were under the plough. Practically the whole of this land lies on the Oxford Clay which here forms a poor soil, unkindly and difficult to cultivate, and yielding a very unsatisfactory pasture for many years after it is laid down to grass. Skilful as the old farming was in the cultivation of such land, the fall in prices rendered it necessary to find a new system if the land was to be kept in cultivation and pay any rent.

To Mr. Mason, who had lived in an atmosphere of utilising science for the exploitation of nature, the old farming was too much of a skilled craft working by traditional rules. He conceived that by the proper application of science to its methods it might be given something of the certainty of a manufacturing process.

To reform agriculture by the exercise of scientific principles and business methods has been no uncommon dream ; many and severe have been the losses in consequence, until the old hand can safely indulge in a smile of prophecy as he hears of each new attempt. If Mr. Mason's measure of success was greater it was due to a greater tenacity of purpose ; with a clear conception of the principles he wished to translate into practice he pursued them through repeated failures until he found the working conditions necessary for their application.

The fundamental basis for Mr. Mason's reforms was an exact system of book-keeping. By degrees, as the farming operations grew, one was evolved, complex in appearance but answering its purpose admirably. Roughly speaking a ledger account is opened against each field : on the debit side are the cultivations, seed, manure, &c., together with the rent and interest at 5 per cent. on whatever has been expended on the field at the end of the year over and above the receipts. If the cultivations have cost more than the crop is worth, the deficit is carried forward to the following year and interest is charged on it until it is wiped off. There is no valuation of cultivations, standing crop, &c., at the end of each year, but the strictly cash account is continued for such period as may be thought necessary to test the system adopted. A further debit comes every year under the head of "establishment

charges": this includes rates, supervision, and all miscellaneous expenditure which cannot be allotted, and is divided out according to the acreage. On the credit side come the returns for the crops, either actual, or estimated on the percentage of dry matter in such cases as roots or straw consumed on the farm. Such credits become of course debits in the other accounts kept against the stock. A day's ploughing is charged at a fixed price, which is in its turn divided as credits among the manual labour, horses, and implement accounts. If at the end of the year the account against the "horses" shows that the work for which they have received credits does not pay for their forage, depreciation, interest on capital, &c., the deficit is carried to the "establishment charges" and thus spread equally over the whole land. Similarly with all the subsidiary accounts which have to be opened for each of those bug-bears of farm accountancy—products that are not realised in cash, and operations which possess only a contingent value—when ever they fail to pay their way the deficits are transferred to the "establishment charges."

Turning now to Mr. Mason's schemes of reform, his prime idea was to try and utilise the resources of the soil and subsoil to a much greater extent than was done by the current systems of farming. Only a very small proportion of the nitrogen, phosphoric acid, and potash that are present even in the surface layer of soil ever reaches the crop, still less are the reserves in the subsoil made available; so that we find crops stunted or starved for manure on land which itself may contain manurial matter for a hundred or more maximum crops.

Mr. Mason's early experiments consisted of attempts to utilise the subsoil; but after Hellriegel and Wilfarth's discovery of the fixation of nitrogen by the bacteria present in the nodules on the roots of leguminous plants, his experiments were mainly directed towards making a greater use of leguminous crops, hoping thereby to raise the fertility of the land by natural means until the farm was independent of external sources of nitrogen in the shape of purchased fertilisers. At this time Mr. Mason was in constant communication with Lawes and Gilbert, who were then engaged in verifying Hellriegel and Wilfarth's results by a series of experiments at Rothamsted, carried out partly in pots and partly in small pits isolated from one another by walls of slate. Mr. Mason writes to Dr. Gilbert in 1888: "I am having printed some notes on the growth of Red Clover and Vetches and will send you a copy. I am very

much wanting to see the paper on nitrogen that I understand is to be printed in the Transactions of the Royal Society. I hope you will turn out wrong in the end, and that some plants will be found to be absorbers of atmospheric nitrogen. Considering that the earth was once incandescent, where did all the nitrogen come from that now exists in soils and rocks?"

Mr. Mason inaugurated a similar scheme of experiment but on a somewhat larger scale at Eynsham; at the same time he began various attempts to utilise leguminous crops more freely on the estate. Of course he tried many things which failed or led to no results of consequence, but three lines of investigation may be picked out which did lead to practical results. In the first place the "tank" experiments showed which of the leguminous plants were most effective in gathering nitrogen; the "weathering" experiments showed what the subsoil could be made to yield; and the "field" experiments were attempts to turn to practical account the two principles thus elucidated.

THE TANK AND POT EXPERIMENTS.

For the purpose of these experiments twelve brick tanks were built, each 6 by 3 ft. by 6 ft. deep; six others were 4 ft. square by 6 ft. deep; and forty others were only 15 in. square by 3 ft. deep. In addition, a large number of experiments were made in glazed drain pipes set on end. Arrangements were made to collect the drainage from each tank, and the whole was freely exposed to the weather in the open, but beneath wire netting to keep away birds. As the purpose of the experiment was to test the nitrogen collecting power of the various leguminous plants and their ability to prepare the land for carrying nitrogen consuming crops like the cereals, an artificial soil was prepared containing no combined nitrogen. The local clay subsoil was carefully charred to remove any organic matter, passed through a sieve and a mixture made as follows:—burnt clay 100, carbonate 3 and sulphate of lime 2 parts, basic slag 3 parts, kainit 2 parts. With this mixture—containing no nitrogen but an abundance of phosphates, potash, lime, and all the other mineral constituents of the plant's ash—each tank was filled early in 1890. In order to inoculate the plants with their appropriate bacteria each seed was sown in a pinch of garden mould on the surface of the artificial soil. The produce was cut and dried, the amount of nitrogen being calculated from the dry weight obtained.

The following Tables show some typical results obtained; of course with such small areas the estimated yields per acre are excessive, since the plants can push freely into the vacant space round each plot.

TANK 1.

Crop	Year	Yield per acre	
		Dry weight	Nitrogen
		Cwt.	Lb.
Red clover	1890	20	52
"	1891	40	104
"	1892	27	70
Wheat	1893	43 (30 bushels grain)	46
Barley	1894	17 (17 bushels grain)	19

In this case three years' growth of red clover not only yielded in the hay 226 lb. per acre of nitrogen derived from the atmosphere, but left behind in the soil sufficient nitrogen to grow a normal crop of wheat containing 46 lb. per acre of nitrogen, followed by a small crop of barley containing another 19 lb. The latter crop showed that the accumulations were becoming exhausted, so the tank was sown again with clovers.

TANK 4.

Crop	Year	Yield per acre	
		Dry weight	Nitrogen
		Cwt.	Lb.
Alsike	1890	34	137
"	1891	56	221
"	1892	2	8
"	1893	38	150
"	1894	12	48
Oats	1895	42 (52 bushels corn)	56

In this case, in five years, three good crops of Alsike were grown, which provided 564 lb. of nitrogen per acre in the hay, and enabled the soil to carry in the sixth year a crop of oats containing 56 lb. of nitrogen per acre.

Another of the tanks was sown with an ordinary mixture of seeds for permanent pasture; for ten seasons it yielded fair crops, chiefly of clover, but as the clovers died out the yield of

grass became comparatively small, averaging 36 cwt. of dry matter per acre per annum over the nine years 1890-1898, which may be calculated as containing in all about 720 lb. of nitrogen.

It is, however, the tank containing lucerne which shows the greatest accumulation of nitrogen.

TANK 5.

Crop	Year	Per acre	
		Dry matter	Nitrogen
Lucerne	1890	Cwt. 8	Lb. 24
"	1891	60	188
"	1892	90	280
"	1893	118	366
"	1894	139	433
"	1895	114	352
"	1896	105	325
"	1897	109	338
"	1898	160	480
		Total 2786	

This represents an average annual yield of over 300 lb. of nitrogen per acre, all drawn from the atmosphere, in addition to the accumulation in the root residues remaining in the soil. In 1904 the lucerne was still vigorous though patchy, and samples of soil were taken both from this and from the tank in permanent mixed grass. Unfortunately in 1896 the lucerne tank had been turned out to secure a soil sample at a depth of five feet, and the contents were somewhat mixed in returning the soil to the tank. Analyses of the first and second nine inches showed the following accumulation of nitrogen :—

	Nitrogen	
	Per cent. in dry soil	Per acre lb.
Lucerne, 1st 9 inches . . .	0.0217	651
" 2nd " . . .	0.0143	429
Mixed grasses, 1st 9 inches .	0.0290	870
" " 2nd " .	0.0117	351

The low result for the surface soil in the lucerne tank is due to the mixture referred to above.

At this time of day it is needless to labour the point brought out by Mr. Mason's experiments—that the leguminous plants do gather nitrogen from the atmosphere—but when the trials were started the work of Hellriegel and Wilfarth was still novel, and though it served to explain a long series of outstanding difficulties about the amount of nitrogen found in the clover crop, it ran so counter to what had been the accepted opinion for thirty years that experimenters everywhere were submitting it to careful verification. Incidentally the tank experiments showed that lucerne was by far the best nitrogen collector among the plants tried, a result which began to have an increasing effect on Mr. Mason's field experiments and farming practice, since he found a difficulty in establishing good plants of clover in the dry seasons then prevailing.

Other of these pot and tank experiments dealt with the power of cereals and of leguminous plants to obtain the potash and phosphoric acid from various natural sources. Felspar, coarse and fine, and subsoil clay, weathered or dried at a high temperature, were tried as sources of potash, mixed with sand and peat moss litter to form an artificial soil. The plants, especially lucerne, were found well able to obtain sufficient potash from such sources, even when the percentage of felspar in the soil was reduced to 10 per cent. or so. The same subsoil clay, phosphate of iron, precipitated or calcined, and "dufrenite,"¹ raw and calcined, were also tried as sources of phosphoric acid. The results, however, are not in a form which admits of exact tabular comparison, but serve to show that plants have a very great power of obtaining food from insoluble mineral sources if they are well supplied with nitrogen.

The net result of the tank experiments was thus to confirm for a large number of leguminous plants the conclusions of Hellriegel and Wilfarth as to their power of assimilating free nitrogen, and also to show that lucerne was the most persistent and vigorous of the nitrogen collectors. After 1898 the tanks were practically given no further attention, as Mr. Mason was busy trying to translate their lessons into practice.

EXPERIMENTS ON THE WEATHERING OF CLAY SUBSOILS.

Among the ideas with which Mr. Mason started his farming experiments was that of utilising to a greater extent than at

¹ A double phosphate of Manganese and Iron found as a mineral.

present the vast resources of the subsoil in the way of the mineral constituents of plant food. Just as by better utilisation of the power of leguminous crops to fix nitrogen, the farm could be rendered independent of any extraneous source of this fertiliser, so if the phosphoric acid and potash locked up in the subsoil could be rendered available for the plant, then the increased supply of mineral manure, which is the necessary supplement to the extra nitrogen, could also be obtained without going off the farm. As the ordinary poor clay subsoil with which Mr. Mason was dealing contains in the slice lying between nine and eighteen inches deep, no less than one to two thousand pounds of phosphoric acid and from ten to twenty thousand pounds of potash, and as a big farm crop would only require 40 lb. and 150 lb. respectively, there is clearly plenty of scope for the development of these unused resources.

Mr. Mason's scheme to unlock these reserves depended on stirring up the subsoil and introducing air by means of deep ploughing so that the dormant compounds of phosphoric acid and potash would pass over into such a state of chemical combination as would be available to the plant. The first step was to ascertain how the action of the atmosphere and the natural weathering influences would affect the composition of the soil. Accordingly, quantities of the clay subsoil between the depths of nine and eighteen inches were dug out, dried, and powdered. Some portions were analysed in their unaltered condition and the remainder was spread out in shallow trays and placed below a glass screen so that they were protected from rain, but otherwise freely exposed to the action of the air.¹ There the subsoil was allowed to "weather" for varying intervals of time, after which the contents of the trays were again analysed.

The question was whether the nitrogen compounds of the subsoil could be converted into nitrates, the form in which the ordinary plant obtains nitrogen from the soil. As regards the mineral constituents would the phosphates or potash compounds become more soluble? To answer this latter question recourse was had to the analytical process which Dr. Bernard Dyer had just then been elaborating, whereby the material that a weak solution of citric acid can dissolve out of the soil is regarded as being "available" plant food, in contradistinction to the much

¹ Most of the analyses connected with Mr. Mason's experiments were made in the Society's Chemical Laboratory by Dr. Voelcker, under special arrangements sanctioned by the Chemical and Woburn Committee.

larger "total" amount of the same constituent remaining undissolved in the weak citric acid.

Table I. shows the results of one such series of analyses; the figures give the percentages of total nitrogen, potash, and phosphoric acid present in the soil both at starting and after weathering, also the quantity of the same constituents which may be regarded as available for plant food, *i.e.*, the phosphoric acid and potash soluble in a 1 per cent. solution of citric

TABLE I.—*Result of Analysis of Subsoils sent to Dr. Bernard Dyer, on December 5, 1894.*

Field No.	Taken before weathering					Taken after weathering				
	Phos. acid		Potash		Nitro- gen	Phos. acid		Potash		Nitro- gen
	Dissolved by		Dissolved by		TOTAL	Dissolved by		Dissolved by		TOTAL
	Strong hydrochloric acid	Weak citric acid	Strong hydrochloric acid	Weak citric acid		Strong hydrochloric acid	Weak citric acid	Strong hydrochloric acid	Weak citric acid	
181	·037	·0026	·383	·0072	·034	·042	·0030	·396	·0190	·036
189	·052	·0019	·637	·0074	·042	·051	·0058	·567	·0172	·042
197	·035	·0033	·486	·0146	·036	·035	·0020	·407	·0205	·036
409	·128	·0015	·275	·0067	·060	·132	·0015	·267	·0119	·065
199	·046	·0019	·244	·0071	·044	·044	·0018	·290	·0150	·047
226	·028	·0017	·272	·0145	·050	·033	·0020	·310	·0219	·053
Mean	·056	·0022	—	·0096	·044	·056	·0027	—	·0176	·047

acid. The results show, of course, no change in the "total" amount of any mineral constituent, the differences being only those due to the inevitable errors of sampling and analysis. Even the nitrates show no change, the trifling amount present after weathering being within the limits of experimental error. This lack of oxidation of the store of subsoil nitrogen may be attributed partly to the want of the appropriate organisms, for the bacteria converting other nitrogen compounds into nitrates are only sparingly found below the layer of soil which is actually stirred during cultivation. Probably also the nitrogen compounds in an undisturbed subsoil of this kind are not capable of nitrification, having become so bitumenised as to be incapable of further change, although originally of vegetable origin.

The phosphoric acid soluble in citric acid shows no great change except in one instance, so we may conclude that the mere exposure to weather does not itself alter the condition of the phosphoric acid reserves in the subsoil. But with potash the difference is great; after weathering, the citric acid soluble potash is increased, sometimes two or three fold, the soil originally poor in available potash being, after weathering, as rich in this constituent as the best arable soils. The average of twenty determinations on these and other soils shows a rise in the citric acid soluble potash from 0.0113 per cent. before weathering to 0.0186 per cent. after exposure. While it has always been contended that the well-known practical advantage gained by laying up land roughly for the winter is due to the bringing into solution of the mineral reserves of the soil, in Mr. Mason's experiments this experience was for the first time reduced to scientific form, and shown to be due to the passing over into a more soluble form of the potash compounds and of those only.

THE FIELD EXPERIMENTS.

It has already been stated that the underlying ideas in Mr. Mason's work were the utilisation on the one hand of the subsoil mineral reserves of the soil, and on the other of the power of leguminous plants to gather nitrogen from the atmosphere. Before his eyes were opened to the potentialities of the latter action by Hellriegel and Wilfarth's paper, and by the continuous discussion that ensued with Lawes and Gilbert, he had been experimenting on deep cultivation, accompanied by wide drilling and thin seeding, without, however, obtaining any results of economic importance. Other field experiments dealt with the advantages to be derived from sowing nitrate of soda in successive small doses, and with the value, or otherwise, of bringing a little subsoil to the surface at each ploughing. Deep working of the subsoil was expensive, but brought almost immediately a return in the increased and earlier dryness of the land after rain, so that more days in the year were available for cultivation. The possibilities of nitrogen fixation, however, opened up a new path, and Mr. Mason prepared to alter his scheme of farming to utilise it to the full. The first plan of cropping thus devised was described in the *Agricultural Gazette* for 1891 (Vol. 34, page 445), from the article in which Table II. is transcribed.

TABLE II.—*Scheme of a Rotation of Crops at Eynsham Hall.*

Year	Crop grown	Manure used per acre	Produce per acre	Nitrogen production and consumption by Plant growth per acre			Produce consumed	Produce sold off
Nitrogen-producing Crops								
1st	Spring beans and clover	Basic slag and kainit	12 tons green beans and clover	Produce by crop	Sold off land	Fed to animals on land, part of which returns in excreta	Ensilage	None
				Lb.	Lb.	Lb.		
				130	None	—		
	Clover aftermath	—	3 tons aftermath	32	"	162	—	—
2nd	Clover hay	None	3 tons hay	168	"	—	Clover, hay, and ensilage	Consumed or sold
	Clover hay aftermath (to ensilage)	—	4 tons hay	43	"	211	—	—
Totals for nitrogen-producing crops				373 ¹	None	373	—	—
Nitrogen-consuming Crops								
3rd	Potatoes or mangels, &c., &c.	Dung and basic, or nitrate top-dressing and basic	10 tons potatoes, or 25 tons mangels	Consumed by crop	Sold off land	Fed to animals on land, part of which returns in excreta	Small potatoes or roots mangels	Large potatoes
				Lb.	Lb.	Lb.		
				56	45	11		
				123	—	123		—
4th	Winter wheat or oats	None, or some nitrate top-dressing	36 bushels wheat or 1½ tons of straw	38	38	—	—	Wheat
				22	—	22	Straw	—
Totals for nitrogen-consuming crops				116 or 183	83 or 38	33 or 145	—	—

¹ Taken as derived or fixed from the atmosphere.

After the production in the green plant of 373 lb. of nitrogen per acre, we have to take into account the amount existing underground, in the bean and clover roots, and also the amount which accumulates in the soil itself by the action of the leguminous growth.

As a matter of course, a considerable quantity of nitrogen would be removed annually from the land, by sale of cattle, horses, and pigs bred and fed on it, having in the meantime consumed hay, potatoes, silage, straw, &c.

The general scheme is to grow two nitrogen fixing crops, followed by two others requiring the combined nitrogen which has been accumulated by the previous growth of clover and beans. There is thus a clear gain of nitrogen to the farm over and above what is being sold away as wheat and potatoes, meat and wool.

The rotation began with beans, sown in February, red clover being sown among the beans in April. When the beans were podded and the corn well formed, but while the plant was still green and succulent, the whole, clover and beans together, was cut and made into silage, the quality of the resulting product being good, because the stemmy nature of the beans kept the mass open and induced the right kind of fermentation. The second cut of clover was made into silage also, and in the second year the clover was made into hay or silage in the usual way. The clover ley was deeply broken up by steam, a considerable dressing of basic slag and whatever dung had been made were then put on for the root crop, a dressing of slag and kainit having been previously used for the beans.

The rotation, however, did not prove a success in practice ; it depended upon the making of silage, and this was found to result in too great a loss of dry matter to be an economical way of utilising a fodder crop. The beans and clover mixture were weighed as they went into the silo and the water they contained was determined by drying a portion ; similar estimations made when the silage was carted out of the stack or silo showed a wastage equal to nearly half of the original dry matter. Other difficulties arose from the dry seasons which prevailed throughout the period 1890-1900. It was found difficult to obtain a satisfactory growth of clover in many of the years, and again, it was very doubtful if red clover could be maintained on that soil for two out of every four years.

The repeated failures with red clover turned Mr. Mason's attention to lucerne, a crop which was practically unknown on his clay soil, but which, as the tank experiments showed, could effect an enormous fixation of nitrogen. Writing to Sir Henry Gilbert in 1896, Mr. Mason says : "I have been going on with my agricultural scheme as first laid out—with modifications. My success on the whole has not been striking, but the two dry seasons have had something to do with it. . . . I have long had my eye on lucerne as a plant likely to help me out of my difficulty and widen the distance between the clover

crops. During the last six years I have made many experimental growths, but only within the last two or three years have I started it as a full crop." And again, in 1898, he writes: "It was very desirable in my project to increase the number of leguminous plants as collectors of nitrogen, and lucerne seemed to offer great advantages: length of life, depth of root, valuable green fodder and hay, &c., &c., and also an ideal collector of nitrogen."

A journey into the Isle of Thanet was made to ascertain the best method of managing lucerne, for in that district the crop had long been cultivated and the acreage was increasing with the succession of dry seasons. The farming of lucerne was indeed practically unknown except on the chalk formation and on some of the warmer soils of the South and East of England; to such land as the Oxford Clay farmed by Mr. Mason it was considered wholly unsuited. However, Mr. Mason's scheme was to open up the subsoil by deep steam cultivation, manure liberally with basic slag to furnish phosphoric acid and lime, trusting to the weathering of the subsoil to supply potash and to the lucerne crop to assimilate nitrogen. Finally, after a considerable root residue had been accumulated, he proposed to break up the lucerne, grow a few corn and root crops out of the accumulated fertility and lay down to lucerne again. Unfortunately, in his anxiety to sow leguminous crops only, Mr. Mason made the mistake of drilling his lucerne without a cover crop, and as the seasons were dry this resulted in a bad plant, a defect from which the fields never recovered financially. After a year or two of such failures Mr. Mason began to drill his lucerne among beans, and though they do not afford the most satisfactory of cover crops the result was a much better stand of lucerne, the necessary foundation for the success of the whole scheme. Possibly, too, the earlier sowings of lucerne grew indifferently because of the lack of the appropriate bacteria in a soil which had never before grown lucerne; the American farmer, for instance, when introducing "alfalfa" into a new district has learnt the desirability of sowing with the seed a little soil from an old lucerne field.

Mr. Mason laid down several hundred acres with lucerne, but he did not always carry out his original intention of cropping out the accumulated nitrogen with corn or root crops; instead, he sowed grass seeds as the lucerne was getting old and brought the field into the condition of permanent pasture. Careful accounts were kept against each field and it is only in those

FIELD 38AB, 35 Acres. Laid down to Lucerne in 1896
at a cost of 171l. 16s. 0d.

<i>Dr.</i>				<i>Cr.</i>			
	£	s.	d.		£	s.	d.
1897.							
Cost of laying down	171	16	0	Green forage	32	11	4
Rent	35	0	0	Grazing	2	7	3
Labour	60	19	4	Hay	84	10	0
Straw for thatching	3	0	0				
Establishment charges	6	0	8				
Interest on above items							
less value of green							
forage and grazing	12	0	10				
1898.							
Labour	83	9	10	Hay	110	0	0
Straw, seeds, &c.	7	7	8	Green forage	112	9	3
Rent	35	0	0	Grazing	6	15	0
Establishment charges	3	19	3				
Interest	12	12	0				
1899.							
Labour	84	3	6	Hay	141	0	0
Straw, &c.	7	1	6	Green forage	24	7	10
Rent	35	0	0	Grazing	3	15	0
Establishment charges	5	19	7				
Interest	8	8	6				
1900.							
Labour	75	11	7	Hay	143	10	0
Straw	3	0	0	Green forage	13	14	4
Rent	35	0	0	Grazing	3	15	0
Establishment charges	9	2	5				
Interest	6	10	6				
1901.							
Labour	48	8	10	Hay	189	0	0
¹ Seeds	24	0	8				
Straw	3	0	0				
Rent	35	0	0				
Establishment charges	9	16	1				
Interest	4	16	3				
1902.							
Labour	48	18	7	Hay	110	17	6
Straw	2	9	6	Silage	42	18	0
² Rent	30	0	0				
Establishment charges	8	4	11				
Interest	2	19	9				
1903.							
Labour	34	0	6	Hay	115	2	6
Straw	3	0	0				
Rent	30	0	0				
Establishment charges	10	8	3				
Interest	2	7	6				
Balance being profit	137	19	0				
	£1,136	13	0		£1,136	13	0

¹ Land sown with grass mixture in 1901.

² Five acres cut off the field for other purposes.

cases where a good plant of lucerne was established at the outset that the field shows a profit; but whenever the field was properly managed and the lucerne established, the accounts provide an ample justification of Mr. Mason's ideas.

It will be seen that as regards this field (38AB) a profit of 11*s.* 9*d.* per acre was secured during the seven years considered, in addition to a rental of 20*s.* per acre and 5 per cent. interest on all the capital employed. At the end of the time the estate was in possession of a valuable pasture instead of an arable field, a pasture which had been built up by deep cultivation and manuring with basic slag, and which was then rich in the accumulation of five years' growth of leguminous crops. The pasture would certainly appeal to any grazier as superior to the general run of permanent pastures in that part of Oxfordshire: it consists of a vigorous mixed herbage, full of clovers, and had no signs of the degeneration into a mass of bent grass which characterises so much of the grass land on the Oxford Clay. For this good result the subsoil cultivation is to a large extent responsible, aided by the deep roots of the lucerne, which by their growth and decay open up the soil and prevent it settling down into the intractable surface that results in an impoverished shallow-rooting vegetation. Had the lucerne been laid down in beans, as was done later, the loss on the first year would have been much reduced and the lucerne growing the more profitable, as we learn from the balance-sheets of other fields laid down later.

Another example of Mr. Mason's method of utilising lucerne is seen in the field (270A), where after seven years of lucerne the land was broken up and a crop of roots followed by oats was taken. The lucerne more than paid its way, although laid down at great expense, at the same time it accumulated so much fertility that two nitrogen consuming crops could be grown at a very small cost for manures. For the whole period of nine years the land showed a profit of 18*s.* 7*d.* per acre, in addition to its rental of 20*s.* and 5 per cent. interest on the capital.

In the light of these balance-sheets and the present aspect of the land we are justified in considering that Mr. Mason had solved the problem he set himself—how to utilise on the one hand the natural resources of the subsoil, and on the other the nitrogen fixing power of the leguminous crops. He showed that by the introduction of lucerne, a crop previously unknown on these clay soils, a leguminous growth could be obtained which would endure for some years at a small

FIELD 270A, 11 $\frac{3}{4}$ Acres. *Wheat Stubble, Autumn, 1894.*

<i>Dr.</i>				<i>Cr.</i>			
1895.				£ s. d.			
Cultivations to Michael-							
mas, 1894	54	12	3	Green forage	5	6	9
Labour	30	4	11	Hay	15	4	6
Seeds	14	8	3				
Rent	11	15	0				
Establishment charges	4	3	2				
Interest	5	3	6				
1895—1901. ²							
Labour	98	11	6	Hay	156	5	0
Straw, &c.	7	3	6	Green forage	161	3	6
Rent	70	10	0	Grazing	21	0	9
Establishment charges	14	16	9				
Interest	15	15	0				
1902.							
Steam subsoiling	31	3	2	Mangels, 190 tons at 13s.	123	10	0
Labour	59	9	8	Swedes 40 „ 13s.	26	0	0
Seeds	4	1	0	Cabbage, 4·4 „ 10s.	2	4	0
Basic slag and nitrate	6	4	9				
Straw	6	0	0				
Rent	11	15	0				
Establishment charges	3	4	8				
Interest	3	18	0				
1903.							
Labour	44	4	5	Oats, 110 qrs.	102	0	0
Seeds	5	5	0	Straw, 14 tons	21	0	0
Nitrate of soda	11	0	0				
Straw	2	12	6				
Establishment charges	4	1	8				
Rent	11	15	0				
Interest	3	7	3				
Balance, being profit	98	8	7				
	£633	14	6		£633	14	6

¹ Includes 40% for a share of subsoiling and basic slag in 1893.

² Summarised from the yearly accounts.

expense for tillage, and produce sufficient keep to pay for the heavy initial outlay for deep cultivation and manures. Finally on the fertility thus accumulated, either good crops of roots and corn could be grown, or the land could be successfully brought into the state of permanent pasture. How long the effect of the lucerne would continue in the arable crops, or how enduring the pastures would be, are matters still to learn, but there is little reason to fear that the scheme could not begin afresh with a deep cultivation and a re-seeding to lucerne.

LIVE STOCK.

Any account of Mr. Mason's agricultural work would be incomplete if no mention were made of his stock feeding

trials, but as he was not working out any new ideas in this direction it will be sufficient to discuss the results very briefly. Each year as stock were bought in to fatten off, careful records were kept of the food consumed and the rate of increase in live weight, and a series of comparisons was made season by season to ascertain the relative financial results of high or low feeding, the use of concentrated or of coarse fodders, the effect of age in the stock, &c. At the close of each trial statistics were taken out of the amount and nature of the food consumed, and balance-sheets were drawn up showing both the financial results, and the number of digestible food units which had been required for maintenance and for the increase of live weight. Table III. shows the record of one such experiment, where seventeen bullocks at grass in the summer of 1897 were also supplied with green lucerne and concentrated foods in the shape of cake and corn. A comparison is drawn between these results and others obtained in experiments at Hohenheim and Woburn respectively, where, however, the cattle were entirely stall fed.

The comparisons, indeed, are vitiated by the different conditions under which the experiments were carried out, as Sir John Lawes states in a note on the detailed account of these trials which Mr. Mason had sent to him. He wrote—

It is well known that oxen on pasture will increase much faster on grass alone during the summer months than they will increase later on with cake in addition. It is quite clear that the manure values of the foods have been calculated too high, and that there has been a loss in the feeding due chiefly to the purchasing price being much too high.

This latter sentence touches the weak spot of the bullock feeding trials; although they showed very clearly that rapid feeding to comparatively young stock succeeded much better than a slower method with a lower ration of concentrated food and older beasts, also that the lucerne and silage raised in such quantities on the estate formed effective stock foods; yet they rarely showed a profit for bullock feeding unless an excessive credit were taken for the manure. The trials, in fact, from a financial standpoint were vitiated by the want of the skilled grazier's eye in the buying and selling.

Mr. Mason early arrived at the conclusion that pigs could be made the most profitable kind of live stock; he kept very large numbers of Tamworth-Berkshire crosses in the fields. There the pigs were allowed to graze at will, just having a rough shed to retire to for shelter; in addition to the grass

TABLE III.—Comparison between 17 Bullocks fed at Eynsham Hall, 16 Bullocks fed at Hohenheim, and 14 Bullocks fed at Woburn.

	Weights		Foods						Gains		Cost of production of 1 lb. live weight increase	
	Initial	Final	Per head per day			Per 1000 lb. live weight per day			Per head per day	Per 1000 lb.	No allowance for manure	Allowing for manure
			Dry matter	Digestible dry organic matter	Equal to starch	Dry matter	Digestible dry organic matter	Equal starch				
<i>Hohenheim</i> . 16 bullocks for 120 days }	Lb. 1595	Lb. 1901	Lb. 42.27	Lb. 26.63	Lb. 26.88	Lb. 24.18	Lb. 15.23	Lb. 15.37	Lb. 2.55	Lb. 1.46	5.07	8.47
			To increase " maintenance . . . 4.08 . . . 22.80			To increase " maintenance . . . 2.34 . . . 13.03						
<i>Eynsham</i> . 17 bullocks for an average of 138 days }	985	1344	29.97	19.43	19.95	25.73	16.69	17.13	2.60	2.23	3.0	4.6
			To increase " maintenance . . . 4.14 . . . 15.81			To increase " maintenance . . . 3.57 . . . 13.56						
<i>Woburn</i> . 6 (heavy root feeding) }	1197	1432½	25.00	16.69	17.22	19.00	12.70	13.10	2.04	1.55	5.23	7.85
			To increase " maintenance . . . 3.25 . . . 13.97			To increase " maintenance . . . 2.47 . . . 10.63						
<i>Woburn</i> . 8 (light root feeding) }	1200	1420	24.54	15.77	16.35	18.73	12.00	12.48	1.80	1.37	5.50	8.45
			To increase " maintenance . . . 2.87 . . . 13.48			To increase " maintenance . . . 2.19 . . . 10.29						

they received barley and maize meal, roots, &c., but were never brought into a very fat state, since a good market existed for them as bacon pigs. The accounts for two years before me show that in each year about 100 tons of live weight were produced in all, at a cost of a little under fourpence per pound, without allowing anything for the manure value of food consumed. These active little herds of red and black pigs on the pastures formed a very characteristic feature of Mr. Mason's farming.

CONCLUSION.

The history of Mr. Mason's experiments will illustrate the difficulties which beset the path of the innovator in agriculture. In any manufacture a single man, by the invention of a new process, or the design of a new machine, may in a few years entirely revolutionise the industry; in agriculture, where one has to deal with living things, and with the seasons which are beyond control, progress is slow and doubtful. The man with the ideas has not always the necessary experience to translate them into practice, nor is he always well served by those to whom he entrusts the work.

We may claim for Mr. Mason that having grasped the fruitful idea of utilising the leguminous plants as nitrogen gatherers, and having made sure of his ground by numerous small scale experiments, he eventually succeeded, after several failures, in working out a practicable method. His method of using the lucerne crop for the improvement of poor clay land of the type met with on the Eynsham Hall Estate was a novelty. It has been amply justified by its results, and, without doubt, will slowly spread and become part of the tradition of farming on such land.

A. D. HALL.

Harpenden, Herts.

COTTAGES FOR RURAL LABOURERS.

INTRODUCTORY.

THE question of cottages for rural labourers has been referred to from time to time as occasion required in the Journal of this Society, and designs have been given. It is now revived owing to the opinions entertained by various authorities that the absence of suitable dwellings is one of the causes of rural depopulation. That this depopulation has been and is still going on there is no doubt, but to what extent it is caused by the bad condition of many of the labourers' cottages is difficult to ascertain, owing to the fact that conditions and circumstances vary more or less in every district. It is therefore unwise to draw hard and fast lines on this, or, indeed, on any other point connected with land and its equipment with buildings or cottages. Present wants may indicate that improved cottages in a given district are necessary, but regard should be had to future requirements, for we live in an age in which altered conditions soon arise. The improved means of communication between the country and towns which is sure to take place will tend to bring about many changes.

There are indications that labourers, and more particularly their wives, prefer to live amongst neighbours in those parts of villages where cottages are grouped, although the men have to walk further to their work. Thus an important point arises in connection with the selection of sites when new cottages are deemed necessary. Moreover, many owners and agents of estates are acquainted with costly mistakes which have been made in the erection of farm buildings and farmhouses arising from hastily formed opinions and a want of foresight. Similar errors may arise at the present juncture in respect of the erection of labourers' cottages, if care be not taken to avoid them; hence it seems necessary to view the question from every possible standpoint before deciding to build.

Cottage accommodation for agricultural labourers formed part of the inquiry of the Royal Commission on Labour in

1893, and the Reports of the Assistant Commissioners for various districts were ably summarised by the late Mr. William Little.¹

His Report will well repay perusal, but space forbids anything beyond a brief reference to its conclusions. In his summary Mr. Little states:—

“I have reviewed the whole of the evidence connected with the housing of the agricultural labourer at considerable length, because I am convinced that in the whole field of survey of the conditions under which that class have to live there is no darker spot than it. To recapitulate in brief what I have endeavoured to deduce from the Reports which are before the Commission, I venture to submit the following conclusions:—

“The supply of cottages is not now generally defective in respect of numbers, owing partly to the decrease in the rural population, and partly to the large number of cottages which have been built by large landowners and others who can afford to build without an expectation of a profitable return for their outlay.

“The distribution of cottages is irregular, and their situation often very inconvenient for the inhabitants.

“The accommodation provided in respect of the number, size, and comfort of the rooms, the sanitary condition, and the water supply are lamentably deficient generally and require amendment.

“The action of the local sanitary authority, though vigorous in some districts, is in many places ineffective, and it is everywhere impeded and sometimes arrested by the knowledge that the owners of insanitary dwellings have not the means to remedy the defects, and that the consequences of closing such dwellings would be to make the present inhabitants homeless.

“The rent which is received for cottage property in rural districts is not sufficient to make the building of good cottages directly profitable.

“That rent has generally no relation to the size of the cottage, the cost of its construction, the accommodation which it affords, its condition as regards repair or sanitary arrangements, or to the earnings of the occupier.

“Under these circumstances I venture to submit to the Commission that the subject is one which deserves the gravest consideration, with a view to the suggestion of remedial action.”

After many years' experience in the management of estates in various parts of the country, these views appear to me to be sound. Again Mr. Little says:—

“A conclusion which may be drawn from the facts submitted is that cottage building for agricultural labourers does not pay directly as a commercial undertaking. Large or wealthy landowners may continue from philanthropic motives and from a sense of duty to indulge in unremunerative investments, but the ordinary owner of land cannot follow their example, and a great and general improvement of cottage property cannot be anticipated until some means are devised for making cottage building directly remunerative as an investment.

“There are three directions in which it would seem to be possible to approach to a more satisfactory adjustment of outlay and return:—

“I.—To reduce the original cost by the adoption of the best plans for economising space and construction and the use of materials most readily available.

¹ Royal Commission on Labour, *The Agricultural Labourer*, Vol. V., Part I. General Report by Mr. William C. Little, page 89.

"II.—By loans at a low rate of interest.

"III.—By an adjustment of rent in proportion to the character and amount of accommodation afforded.

"IV.—By the attachment of larger gardens than are now usual, to cottages where such a course is practicable."

These conclusions also seem to be worthy of attention, and the reduction of cost by the adoption of suitable plans is the main object of this article.

The recent Report on Rural Depopulation by a Committee appointed by the Central Chamber of Agriculture also comments upon the condition of cottages. The Committee were of opinion that "Cottages with better accommodation and gardens, or allotments, where necessary, . . . would tend to increase the number of skilled labourers, to retain on the land the brighter and more active young men of labouring families, and to keep up an adequate supply of the best type of labour for the large farms." They also thought "that it would be of advantage to the whole country, as well as to the districts directly concerned, if loans from Imperial sources were obtainable by landowners and others on most favourable terms for the equipment of small holdings and the provision of cottages."¹

Mr. A. Wilson Fox, C.B., who has been associated with several Commissions of Inquiry on agricultural subjects, made copious references to the cottage question in an interesting paper read before the Statistical Society on April 21, 1903. I will only quote the following passage, which makes a forcible contrast between the bad and the good type of cottage :—

"The contrast between the classes of cottages often in the same parish is extraordinary. In the old type of cottage there is often overcrowding in the sleeping rooms, low ceilings, small windows, rickety stairs ; while down stairs the living room is often a small kitchen possessing no back door, where the cooking and washing have to be done. The discomfort in case of illness in such places can be imagined. Add to this, dampness on the ground floor, general want of repair, little or no garden, no proper outhouse or sanitary arrangements, and water to be fetched from some distance, and occasionally nothing but pond water to be obtained, and you get some of the influences which make the agricultural labourer not disinclined to move elsewhere when he gets the chance. In the new type of cottage there are often three bedrooms, a kitchen, and scullery or pantry ; also a parlour, good outhouses, including a washhouse with a copper, or a bakehouse, and a garden and pig-sty. This class of cottage is not merely a dwelling, but a home. Health, decency, cleanliness, and comfort can be obtained ; the wife need not be a slut, nor the husband a drunkard, nor the children little 'hooligans.'"²

These extracts are sufficient to show that, in the minds of experts, bad dwellings furnish at least one reason out of others (some of which no doubt are equally or even more weighty),

¹ Proceedings, Central Chamber of Agriculture, Vol. 3, 1903, page 122.

² Journal, Royal Statistical Society, Vol. LXVI., Part II., 1903, page 305.

why the deplorable depopulation of many of our villages has taken place. The gravity of this decrease not only injuriously affects agriculture, but, it is to be feared, the nation at large. The continual rise of wages has perhaps had much to do with it, as farmers are compelled to manage with as few labourers as possible ; and the general awakening due to the spread of education, with the attendant ambition of children to obtain better positions, has caused them to desert their old homes. But where these can be made more attractive and comfortable, the inclination to leave them cannot be so great, particularly if large gardens or a little grass land, even a pig run, are added to counteract the allurements of town life.

BUILDING BYE-LAWS.

An important point for the consideration of those who contemplate building cottages arises in respect of the bye-laws of District Councils, which in some places are said to be so onerous as to become a cause of unnecessary expense in their erection. No doubt this is occasionally, and perhaps frequently, the case ; but as there has been a good deal of misapprehension as to the persons who are responsible for the making of bye-laws it is desirable to state who they are. Many persons have supposed that the Local Government Board have compelled Rural District Councils to make bye-laws for their districts ; but this is not so, as the initiative rests with the Councils themselves. They can provide them or dispense with them altogether at their discretion, as the following extract from a Memorandum annexed to the Model Bye-laws for Rural Districts, issued by the Board in 1901, will show :—

“ It has been represented to the Board that it would be useful if a series of model bye-laws were framed, dealing only with the subjects which are most in need of regulation and control in a rural district from a sanitary point of view, and omitting the additional requirements usually found in a code of bye-laws in force in an urban district. The Board have, therefore, drawn up the accompanying series of model bye-laws. They are confined to matters affecting health.

“ The Board are not in a position to advise as to what bye-laws are needed in particular rural districts. The responsibility rests with the Rural District Council in each instance of determining, on consideration of the circumstances of their district, what bye-laws (if any) they will propose to make. The model is intended to serve as a guide to them in dealing with the most important sanitary requirements in connection with new buildings. It must not be regarded as excluding the adoption of further provisions, where these are found to be necessary.

“ Portions of many rural districts are distinctly urban in character, and the development of building is constantly changing the aspect of the country : and it devolves on Rural District Councils to endeavour to apply to the several parts of their districts such regulations as the circumstances may, from time to time, seem to require. The present series contains no clauses dealing with questions

of stability or the prevention of fire, or with the level, width, and construction of new streets. These are all matters that may properly be regulated in portions of rural districts which are assuming an urban character, and circumstances may arise which may render it necessary to deal with one or more of them even in less closely populated areas. Where more comprehensive bye-laws are considered to be necessary for the whole or any part of the district, the Rural District Council may be referred to the model series prepared for use in urban districts. They should carefully study the clauses and select those that are appropriate to the needs of the district, or the portion of it under consideration. In this connection it may be mentioned that a series of bye-laws may be made for part only of a contributory place where the circumstances justify this course. The part should, however, be very clearly defined by a well-recognised boundary line."

From the foregoing it will be seen that, if owners of property think any existing bye-laws in their districts are oppressive, their remedy lies with the District Council, who should be approached with a view to their modification. My own opinion is that in districts, or parts of districts, which are purely rural, building bye-laws are not wanted at all, as anything injurious to health, or any overcrowding, can be remedied under the provisions of the Public Health Act. In the rural district where I reside, there is only one populous place which is one of the suburbs of a town, and the Council made bye-laws for that part of the district only, leaving the other part without. This saves a great deal of trouble and some expense in getting out plans to submit for the approval of the Council, as if bye-laws existed plans would be necessary, even for so small a matter as a new privy.

On the other hand, a similar district in another part of the county has bye-laws which extend to the whole of the parishes, and these, save one parish of an urban character, have an average area of three or four acres per head of the population, while owners in the rural parishes have to comply with the same requirements as are deemed necessary for the urban district. Those intending to improve their cottage accommodation are thus often harassed, particularly when, as it sometimes happens, the bye-laws are needlessly stringent, or are harshly applied.

A case in point has recently arisen in respect of a misunderstanding between Sir William Grantham and the Chailey Rural District Council in Sussex. Sir William has for years past taken a great interest in the housing question, and has erected a good many model cottages on his estate at Barcombe; but recently the Council ordered its clerk to take proceedings, on the ground that one of the cottages about to be built was not in accordance with the new bye-laws.

In a letter to the "*Land Agents' Record*" of October 8, 1904, page 551, Sir William wrote :—

"During the forty years that I have been engaged in building operations as a landowner I have never had such a plan as the District Council demanded for cottage or farmhouse property, and very few of the local builders I have employed could have made one, for they do not keep drawing clerks. For more important buildings, of course, I employ an architect in the usual way.

It is bad enough to have to wade through fifty bye-laws and to understand them (almost an impossibility) before you can begin to build a single cottage to let at 3s. or 4s. a week, but much worse if you have to comply with a fifty-first bye-law in such a way that an official of the District Council could trip you if he had a spite against you, because you had altered the position of a window or the aspect of an earth closet door."

Into the merits of this particular dispute, however, I do not propose to enter. It may still be regarded as to some extent *sub judice*, inasmuch as the defendant has announced his intention of carrying the matter to a higher Court. But the case has an important bearing upon the problem of the housing of the rural population ; and whatever may be its ultimate issue a large section of the public are likely to derive benefit from the prominence given by Sir William Grantham's action to the question of rural building bye-laws and their administration, which undoubtedly needs attention.

Arising out of this case a large deputation, composed of rural landowners and others interested, waited upon the President of the Local Government Board on November 17, 1904, for the purpose of complaining "of the hardships, difficulties, and (or) impossibilities of complying with the Rural District Bye-Laws" in relation to the building of cottages. The action and powers of the Local Government Board in regard to this question were then fully explained by Mr. Walter Long, from whose sympathetic reply to the speeches made it may be assumed that the question of the building bye-laws in rural districts, as affected by recent developments, will not escape renewed consideration by the Government authorities. Mr. Long was justified in taking credit for the issue by his Department in 1901 of the "Model Bye-laws for Rural Districts," to which reference has already been made. The action of the Board in this matter is indeed similar to that which they took in issuing their "Model Regulations relating to Dairies, Cowsheds, and Milkshops," as the result of representations made by the Royal Agricultural Society and other bodies.¹

If bye-laws be made too stringent, building will be discouraged, and the assessment value for rating purposes

¹ Journal R.A.S.E., Vol. 58, 1897, pp. 774-781, and Vol. 59, 1898, pp. xxiv-xxv.

will suffer. This is a view of the question which Rural District Councils may do well to take into consideration. A considerable number of these bodies, in Worcestershire, Essex, Cambridgeshire, and Hampshire, and doubtless in other counties as well, have not adopted any bye-laws.

It really cannot matter to the general public in rural places whether houses, which are detached, or which are in groups belonging to one owner (as is usually the case), are built of wood, iron, or any other material, nor what they are covered with—thatch or other substance. That is the owner's concern, and if he desires to build of cheap materials the occupiers may still have healthy houses, although the construction may not be durable.

POOR RATES.

In passing, I may refer to another serious source of discouragement in the building of cottages, viz., the great increase of local rates, and the want of some radical alteration in the assessment of real property by which an equitable contribution would be obtained from personalty for the benefits it receives from local taxation. Something of the kind was promised by the Chancellor of the Exchequer who introduced the Estate Duty, but it appears that no Parliamentary party cares to take such a radical measure of reform in hand.

STATE LOANS AND LAND IMPROVEMENT COMPANIES.

As the rent of agricultural labourers' cottages does not yield a profitable return, except indirectly by enhancing the value of farm lands, there is naturally some hesitation in investing capital in their erection, especially on the part of limited owners. State loans were authorised in the middle of the nineteenth century for these and other purposes on the security of estates, but there are no funds now available for the purpose, notwithstanding that the Report of the Royal Commission on Agricultural Depression recommended that Parliament should again authorise an issue of such loans.

This part of the question was referred to at some length in an article I wrote in the *Journal* on a previous occasion,¹ as well as the work done by the companies formed under the Land Improvements Acts for financing owners, and, with the

¹ "Small Holdings and their Equipment," *Journal R.A.S.E.*, Vol. 57, 1896, p. 271.

sanction of the Board of Agriculture, charging their estates with a rent charge for a term not exceeding thirty-one years. A hope was expressed in the article in question that as works of a durable kind, such as substantial buildings (including cottages), were usually in good condition at the end of that period the repayment might be extended to forty years, and this extension was, I am glad to say, subsequently granted under the Improvement of Land Act, 1899.

The advantage thus gained will no doubt act as a stimulus to the provision of better cottages, as the decrease in the amount of the annual charges for repayment shown in the following Table, submitted by Sir Thomas Elliott to the Royal Commission, will show :—

Table of the annual Sums which will pay off 100l. with Interest by way of Annuity at the several Rates and for the several Periods understated, calculated upon the Basis of the Payments being made half-yearly.

No. of years.	Rate $3\frac{1}{4}$ per cent.	Rate $3\frac{1}{2}$ per cent.	Rate $3\frac{3}{4}$ per cent.	Rate $3\frac{1}{2}$ per cent.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
20	6 15 3	6 16 10	6 18 4	6 19 10
30	5 3 2	5 4 10	5 6 6	5 8 2
40	4 8 0	4 9 8	4 11 6	4 13 4
50	3 19 4	4 1 2	4 3 1	4 5 0

The rent charges resulting from the employment of the Land Improvement Companies have hitherto varied from about 5l. 6s. to 6l. 7s. 6d. per cent., according to the term of years and the nature of the improvement; but on the forty years principle these figures will be considerably modified.¹ No doubt the effect of this is apparent from the fact that the Annual Report for 1903 of the Board of Agriculture shows that the expenditure sanctioned by the Board for the erection of labourers' cottages, which had been declining for some years previous to the extension to forty years in 1899, immediately began to increase after that year.

¹ I am indebted to the General Land Drainage and Improvement Company for information on this point. They state that "the annual instalment (sinking fund and interest) to repay an Improvement Loan in forty years is 4l. 16s. 11½d. per cent.—the interest being calculated at 3½ per cent., which is the lowest rate of interest at which Improvement Loans can be obtained at the present time. If money could be obtained at 3¼ per cent. interest, the instalment for forty years would be 4l. 9s. 8½d. or at 3½ per cent. interest, the annual instalment would be 4l. 13s. 3½d."

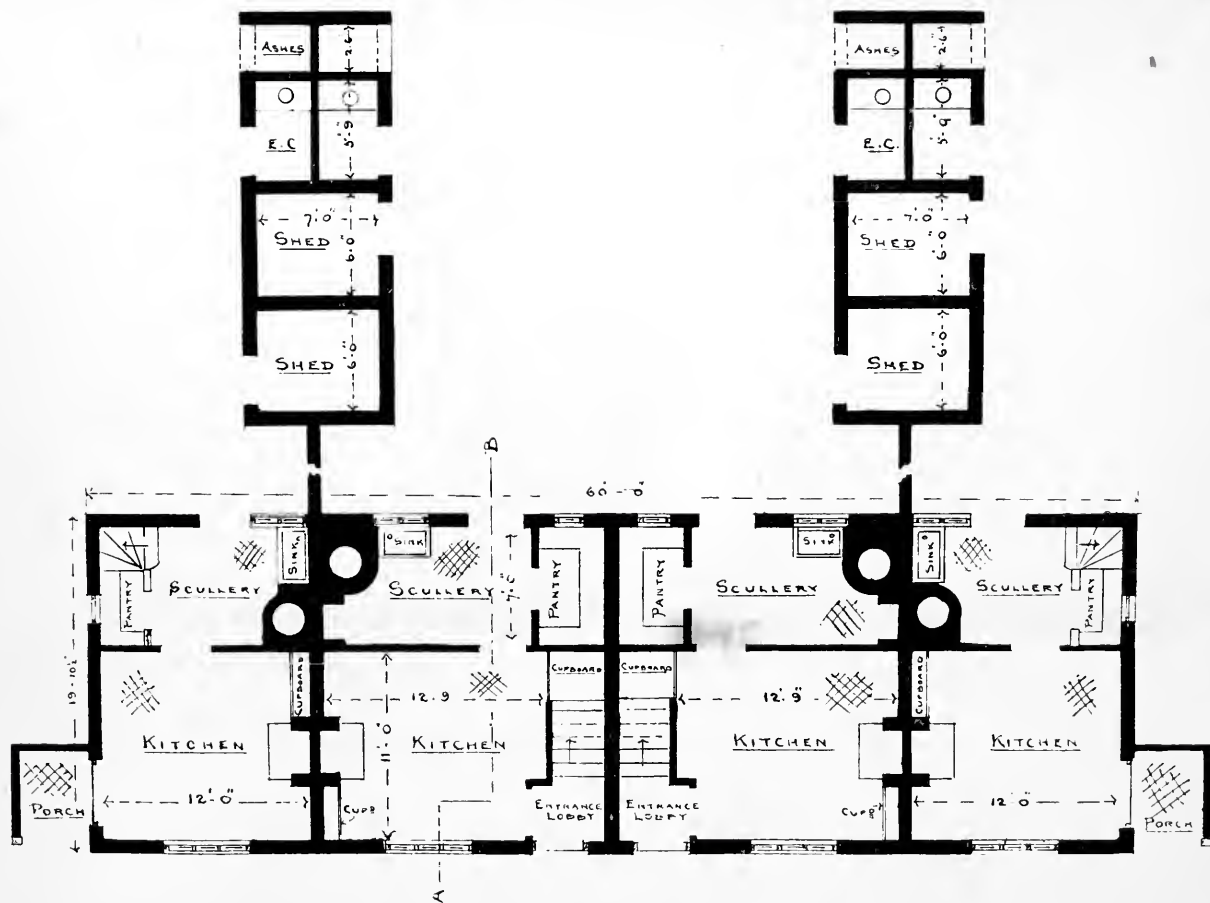


FIG. 1.—Ground Plan.

PLAN No. 1. FOUR COTTAGES (see page 134).



—SCALE—

(Applicable to all the Plans).



But facilities for building would be further increased if Government loans were renewed at a low rate of interest, as shown by Mr. W. C. Little in the before-mentioned Report. One of his conclusions is that :—

“Government loans to landowners, at such a rate of interest as would secure the State from loss, might diminish the difficulty which many proprietors experience in keeping down the interest on loans for cottage building. Under present circumstances, if expenditure of this kind is undertaken upon a loan advanced by one of the land companies, the proprietor has for thirty years to pay from 5·65 to 6·33 per cent. on the outlay in order to provide for the repayment of principal and interest. At the present time the State lends to local authorities in Ireland upon terms which involve an annual charge of 4·825*l.* per annum for thirty-five years, and if the period of repayment be extended to fifty years, the annual instalment is reduced to 4·46*l.* per cent.”

SETTLED LAND ACT.

Facilities are also given to limited owners under the Settled Land Act, 1882, for the payment of improvement works out of capital money in the hands of trustees ; and after a scheme for improvements is approved by them, a certificate of the Board of Agriculture, or a competent engineer or surveyor, that the work has been properly executed, and stating the amount which is properly payable by the trustees in respect thereof, will enable the Board to make an order for payment for the work.

Full details of the procedure will be found in Section 26 of the Act. The estimated outlay on such works (including of course the building of cottages) as were approved of on the nomination of surveyors for the year 1892, was 328,847*l.*, a sum greater by 82,336*l.* than shown in 1891, and very considerably in excess of previous totals. This shows that this useful provision of the Settled Land Act is becoming more widely known and appreciated.

MATERIALS AND DESIGNS FOR COTTAGES.

I now come to the question of the nature of the designs for cottages. There are many to be found which are suitable for the ornamental and superior class of dwellings often required for the immediate surroundings of country seats, but they need not be produced here, as the main object of this article is to furnish plans with a view to the reduction of cost by economising space and construction. There are cottages in many places which do this more or less, but the plans are not always available ; and although I feel that the treatment of the subject has become somewhat threadbare, I have ventured to make a further effort (beyond my previous

article in the *Journal*¹⁾ by submitting a few designs for the attainment of the desired end.

As a minimum of cost with a due regard to efficiency is necessary, every detail must be considered—the superficial area which is required in each apartment, as well as the cubical contents of the living rooms for the preservation of health; and then it remains by a careful arrangement of the parts to avoid the slightest waste of space so that the whole shall occupy a minimum area. This should be combined with an effort to give the best facilities for the working convenience of the inmates, and the use of such suitable materials as the district can most cheaply supply.

In the instructions of the Board of Agriculture with reference to the erection of buildings under the Improvement Acts, it is stated that “three bedrooms should be provided in each labourer’s cottage, neither of them being a passage room to another. Where, however, many cottages have to be built, a proportion with two bedrooms for labourers without families will not be objected to. Fireplaces should be provided in two bedrooms, but in the case of cottages with three bedrooms a ventilator twelve inches square in the ceiling of the third room may be substituted for a fireplace.”

I quite agree that a proportion of cottages, where a number are required, will do with two bedrooms only—say 50 per cent.—as neither men with very young children, nor older men whose families have left home, require more; but of course, if a pair of cottages be wanted in an isolated place for the use of a farm, or otherwise, it is safer to provide the three bedrooms.

Block of Four Cottages.—Plan No. 1 (Figs. 1 to 6) carries out the idea of two cottages with three bedrooms and two with two bedrooms. The ground floor walls are of brick; the walls of the upper storey are of timber studs, with rough cast lath and plaster, and projecting over the kitchens of the end cottages with two bedrooms, thus enlarging these as well as improving the elevation of the cottages. The roof is covered with plain tiling. There are two bedroom fireplaces to each cottage, and the dimensions of the various rooms are fairly sufficient for the ordinary requirements of the class of persons who occupy them. Care has been taken to avoid any waste of space, and

¹ *Journal R.A.S.E.*, Vol. 57, 1896, pp. 288-292.

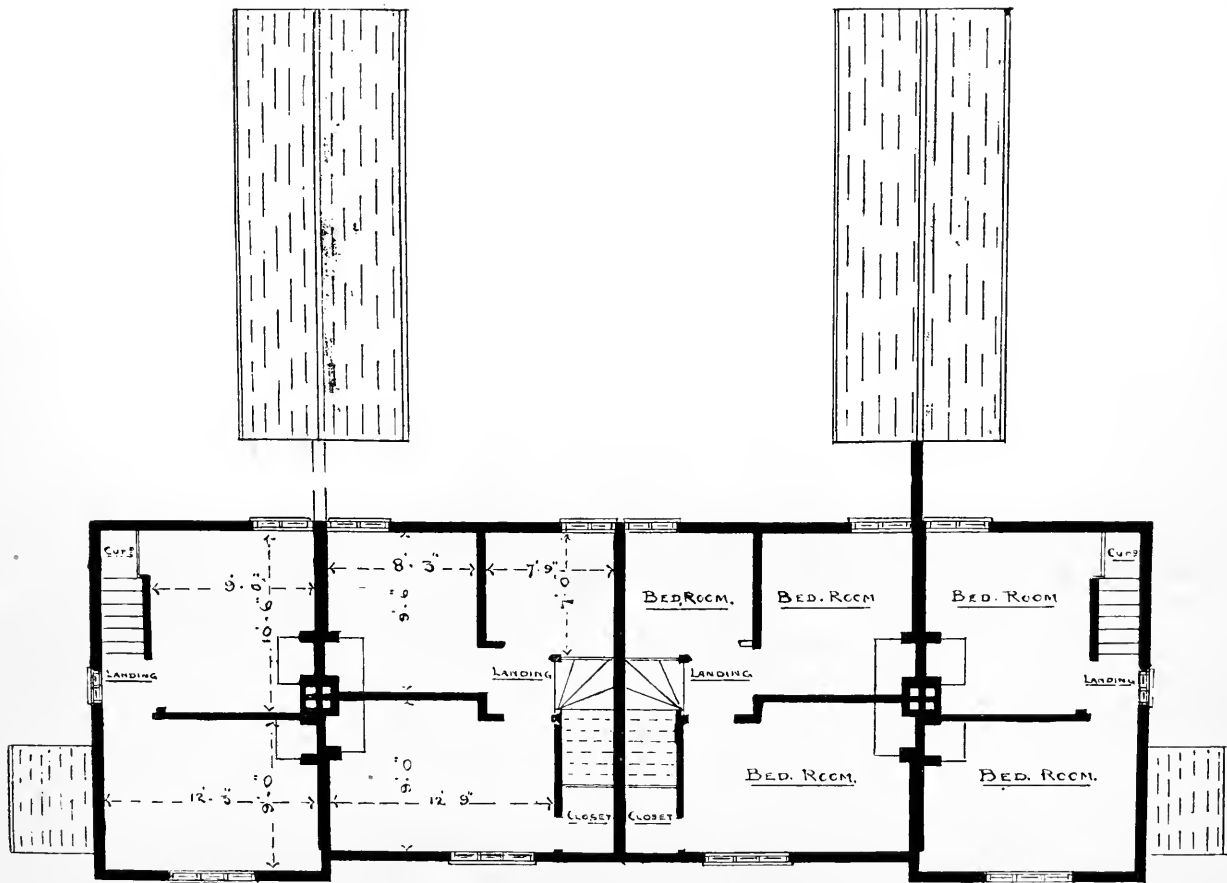


FIG. 2.-Chamber Plan.



to give the maximum amount of convenience. Each of the larger cottages has two fireplaces on the ground floor, and all of them have a copper and sink. The outbuildings can, if desired, be placed parallel with, instead of at right angles to, the house, but they have been found in practice to be suitable as drawn; and if more space is desired in the sculleries, the coppers might be omitted and set up in the sheds. This would be advantageous in other respects also, as the steam would be kept out of the house. A few sheets of corrugated iron over the space between the cottages and the outbuildings would also furnish excellent sheds for coal, &c. The roofs of the dormers at the back are covered with lead.

As regards cost, a careful estimate shows that under ordinary circumstances the block of four cottages, which occupies an area of 1,190 superficial feet, could be built for 480*l.*, including a well of moderate depth and a pump. The outbuildings would cost about 80*l.*, and if 40*l.* were allowed as the value of a site of an acre in extent (which would provide four large gardens—a valuable addition), including the necessary fencing, the total cost would be 600*l.*

It does not seem practicable to build four cottages suited to present requirements for a smaller sum, but of course the amount would vary according to the facilities for obtaining the necessary materials. A small saving, however, might be effected by substituting wooden casements for the lead lights, which were adopted for the sake of their better appearance. On the other hand, if the upper storey walls of rough cast were built of brick, the cost would be a little more.

In connection with this or any other design for a two-bedroom cottage next to one with three bedrooms, a useful provision may be made by which each cottage may be converted at will into one having the larger or smaller number of bedrooms. The stud partition wall should have the woodwork at a suitable place, trimmed ready for door linings and a door, if at any time it should be found necessary to insert them. By this means extra accommodation in a two-bedroom cottage may easily be provided for a labourer with a growing family, without the necessity for a change of cottage; and a good deal of injury to the wall and its subsequent repair would thus be avoided.

Pig-sties are not provided in any of the designs, as handy tenants with some rough materials can put them up at any convenient place on the premises—a small pig run is best if available.

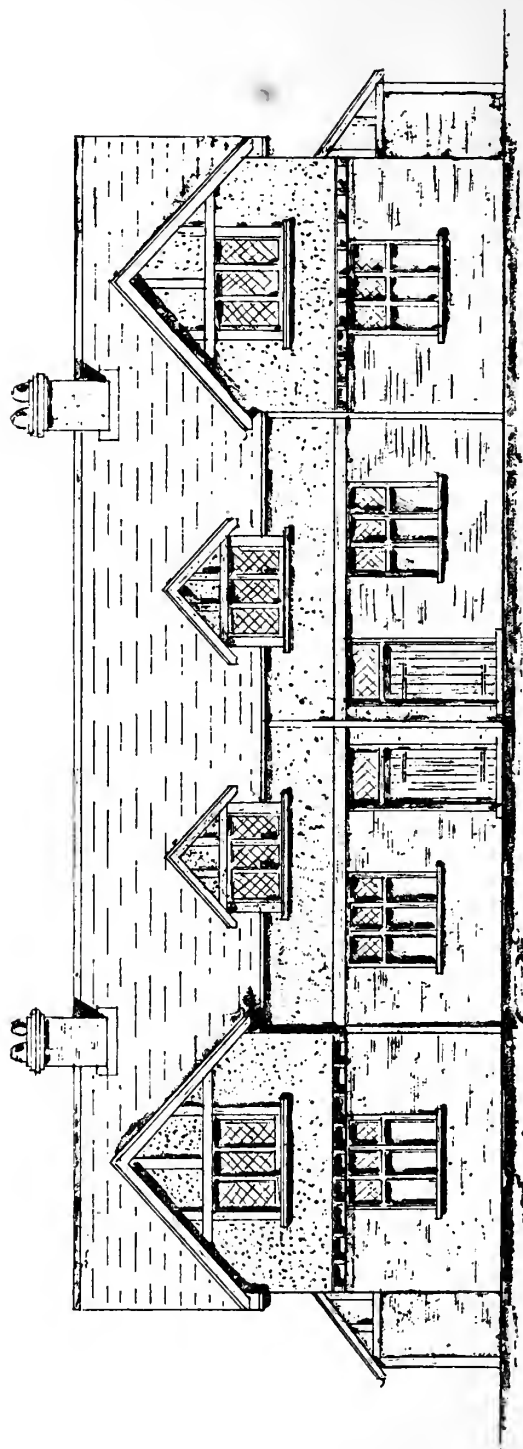


FIG. 3.—Front Elevation.

PLAN NO. 1. FOUR COTTAGES (see page 134).

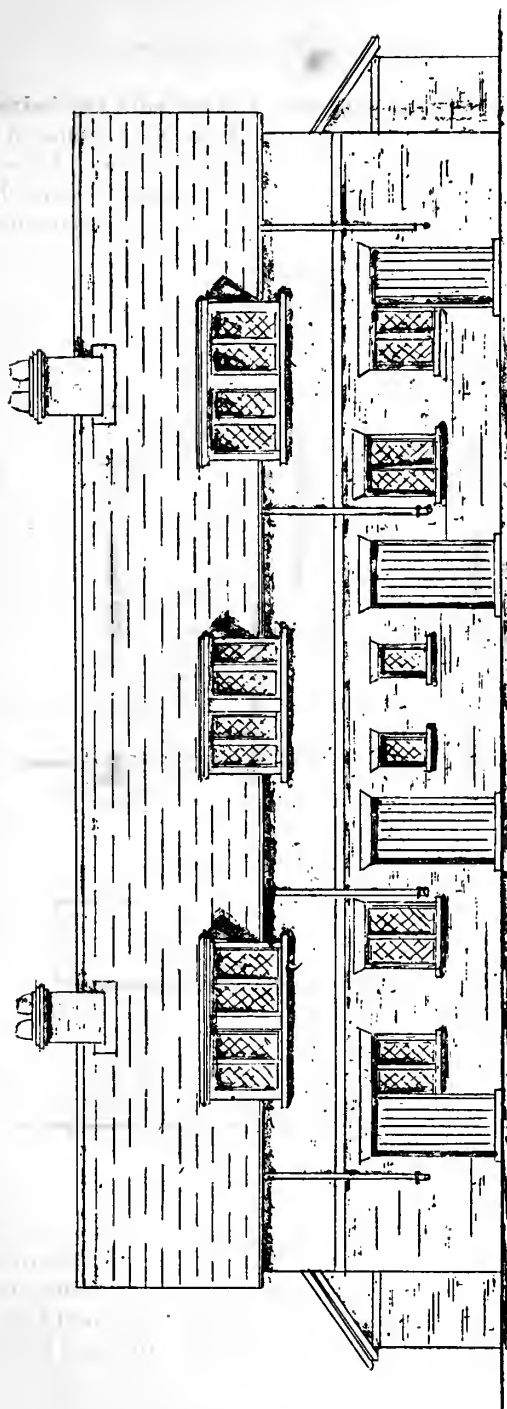


FIG. 4.—Back Elevation.

PLAN NO. 1. FOUR COTTAGES (see page 134).

Pair of Cottages, one with three and one with two bedrooms.—
A line drawn through the centre of Plan No. 1 would of course provide these, by taking one end cottage and one of the centre cottages, and no further description is needed except that one bedroom window would have to be put at the gable end instead of

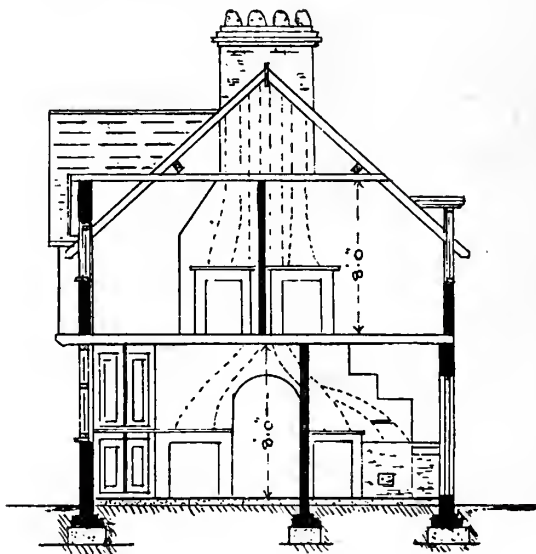


FIG. 5.—Section.

PLAN NO. 1. FOUR COTTAGES.

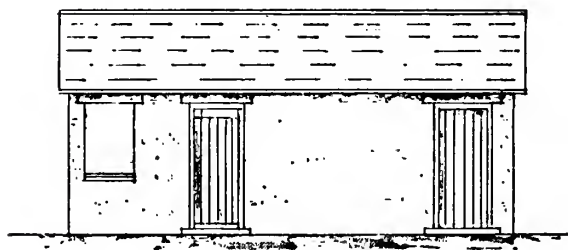


FIG. 6.—Elevation of Outbuildings.

PLAN NO. 1. FOUR COTTAGES.

at the back. The cost, however, would be somewhat in excess of half the block of four, as the division wall in the centre would form an outer wall. There would also be an overhanging gable, and an extra porch would be required. It would for these reasons nearly approach the sum named for the next Plan, No. 2.

Pair of Cottages with three bedrooms each.—Plan No. 2.—The two centre cottages of the foregoing block of four will form an excellent design for these, as shown in Figs. 7 to 10. It will be seen, however, that the position of the cottages in relation to each other is reversed, the entrances and staircases

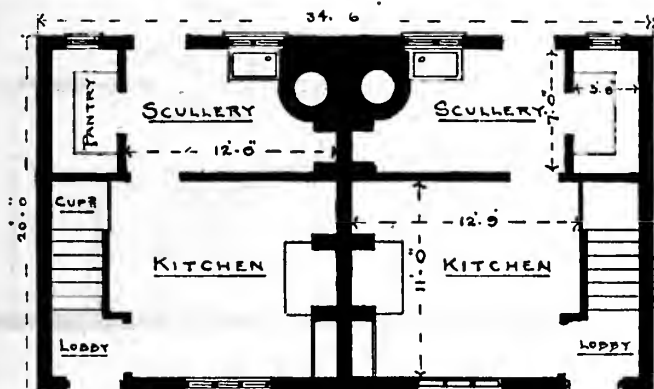


FIG. 7.—Ground Plan.

PLAN NO. 2. PAIR OF COTTAGES.

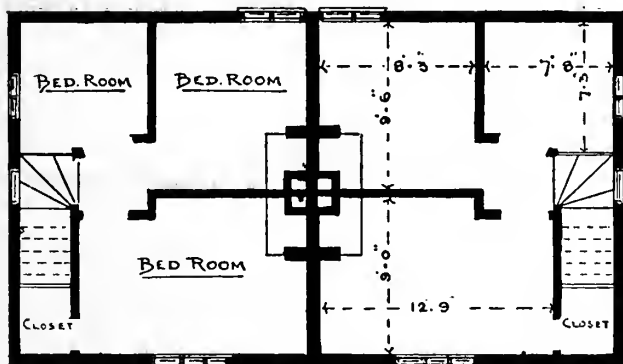


FIG. 8.—Chamber Plan.

PLAN NO. 2. PAIR OF COTTAGES.

being placed against the end walls, and the fireplaces against the division wall. They cover an area of 690 superficial feet, and are estimated at 250*l.* (including well with pump), which, with the outbuildings costing 40*l.*, and say 20*l.* for the site of half an acre and the fencing of the same, amounts in all to 310*l.*

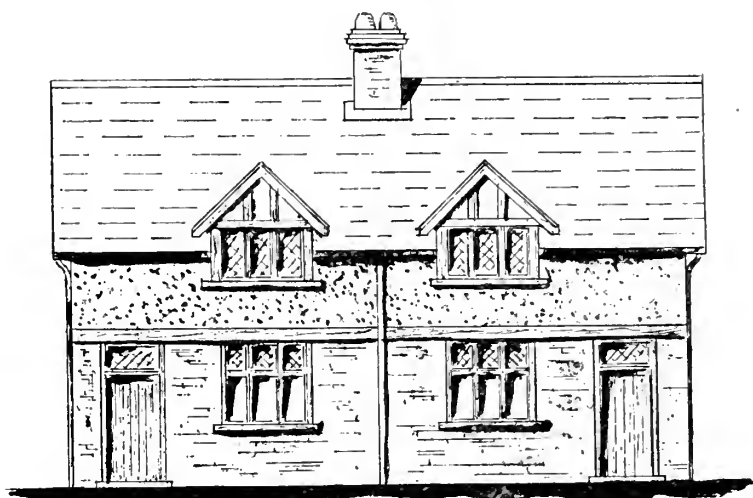


FIG. 9.—Front Elevation.
PLAN NO. 2. PAIR OF COTTAGES.

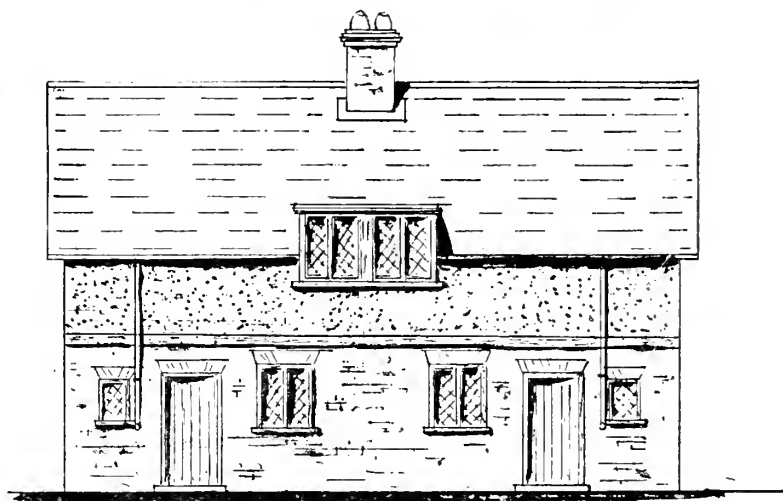


FIG. 10.—Back Elevation.
PLAN NO. 2. PAIR OF COTTAGES.

No Section is given with this plan, as it would be similar to that shown with Plan No. 1.

Pair of Cottages.—Plan No. 3.—This design is shown in Figs. 11 to 14 and represents a class of building nearly square

in outline, which combines, to a material extent, the minimum amount of cost for a pair of cottages, containing living-room, scullery, pantry, and three bedrooms, with a maximum of accommodation. It is built of brick and slated (slated roofs costing less than plain tiled); but if bricks are too costly in any particular district, the walls above the bedroom floor might be

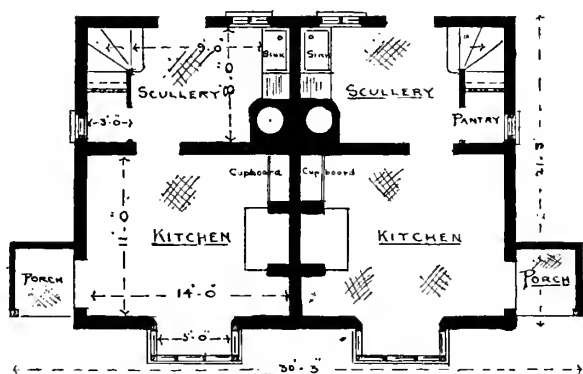


FIG. 11.—Ground Plan.

PLAN NO. 3. PAIR OF COTTAGES.

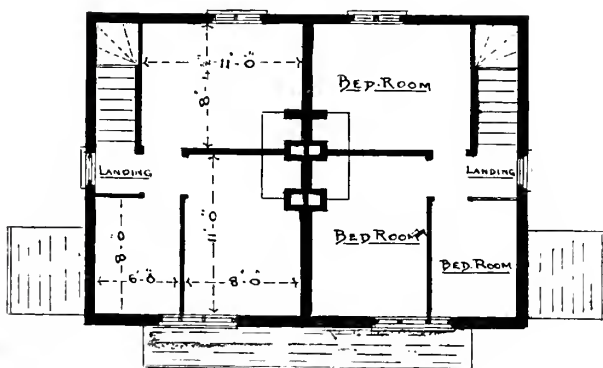


FIG. 12.—Chamber Plan.

PLAN NO. 3. PAIR OF COTTAGES.

constructed of stud work and rough cast such as is shown in the previous designs. Or the whole of the walls might be so constructed, if put on a brick foundation, with brick work used for the chimneys. The superficial area covered is 732 feet, and at a careful estimate the cost of erection would be 250*l.*, inclusive of the sinking of a well of moderate depth. To this

must be added the cost of the necessary outbuildings, say those shown in Plan No. 1, 40*l.*, and a sum of about 20*l.* for a site, making a total of 310*l.* This is the same price as for the Cottages in Plan No. 2, which cover a smaller area; but the economy is effected by the slated roof and a plainer elevation.



FIG. 13.—Front Elevation.
PLAN NO. 3. PAIR OF COTTAGES.

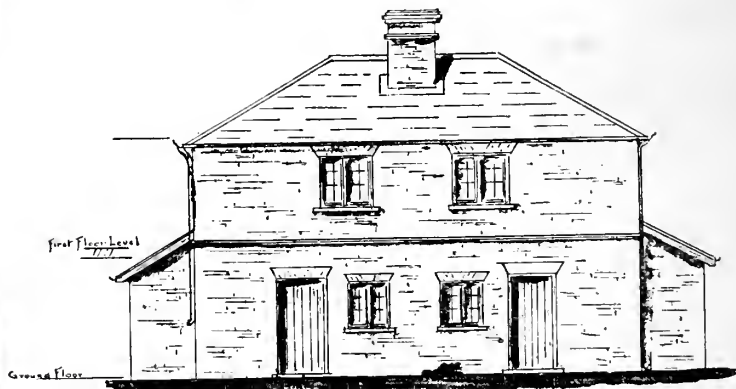
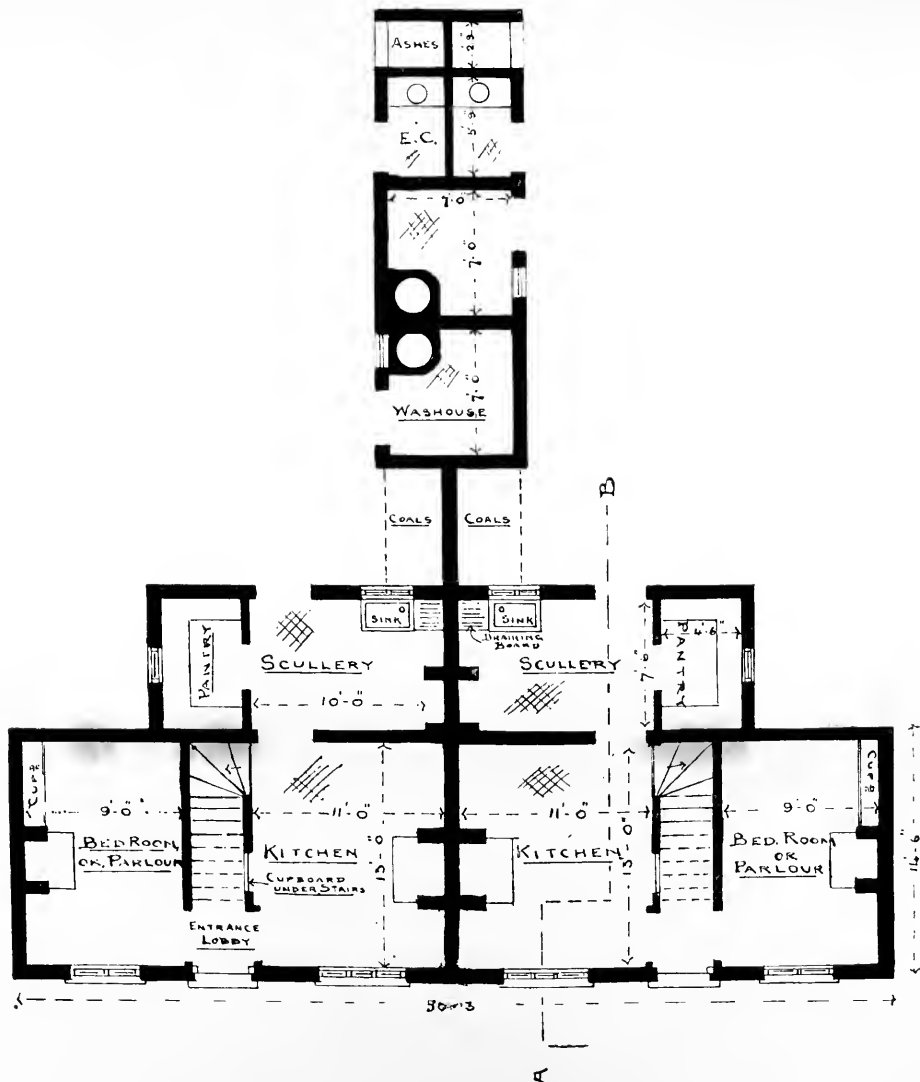


FIG. 14.—Back Elevation.
PLAN NO. 3. PAIR OF COTTAGES.

Care has been taken in the matter of arrangement to avoid any waste of space, and there are fireplaces in two of the bedrooms. The separation of the sexes is secured by the third bedroom, but its small dimensions may be objected to except for little children. This can be remedied, however, by an increase of the frontage, say one foot for each cottage, without





altering the main features of the design, and it would also allow more space on the ground floor for the kitchen and scullery. The latter might also be made more spacious by omitting the copper and placing it in an outbuilding, and

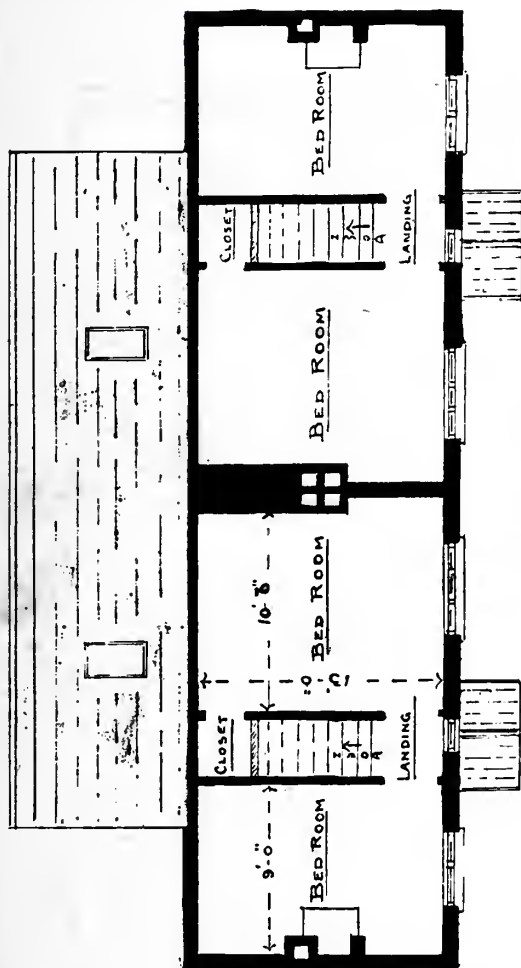


FIG. 16.—Chamber Plan.
PLAN No. 4. PAIR OF COTTAGES.

made more useful by putting in a fireplace where the copper is shown. These alterations, if desired, would not add very materially to the cost of the cottages.

Pair of Cottages.—Plan No. 4.—This design is shown in Figs. 15 to 19, and represents a type of cottage which is not

often erected. It is built of brick and covered with patent Roman tiles of Bridgwater make, occupies an area of 1,030 superficial feet, and being larger than the previous plans and

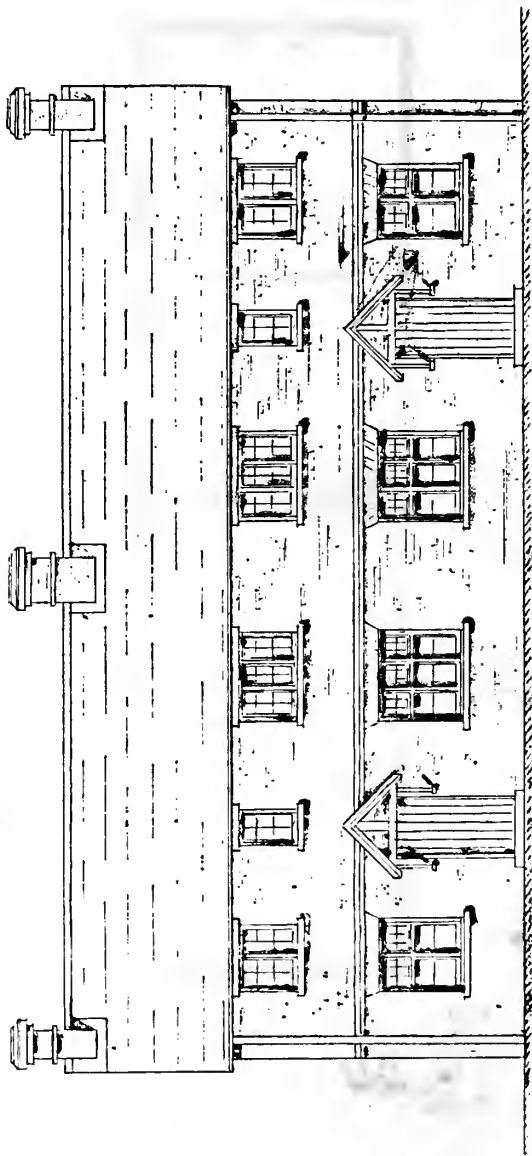


FIG. 17.—Front Elevation.
PLAN No. 4. PAIR OF COTTAGES.

more costly, it has the advantage of additional accommodation. In order to minimise cost this class of tiles is used for the roofing, as there is a saving of 11*l.* compared with plain tiling. They are estimated to cost 300*l.*, including a well.

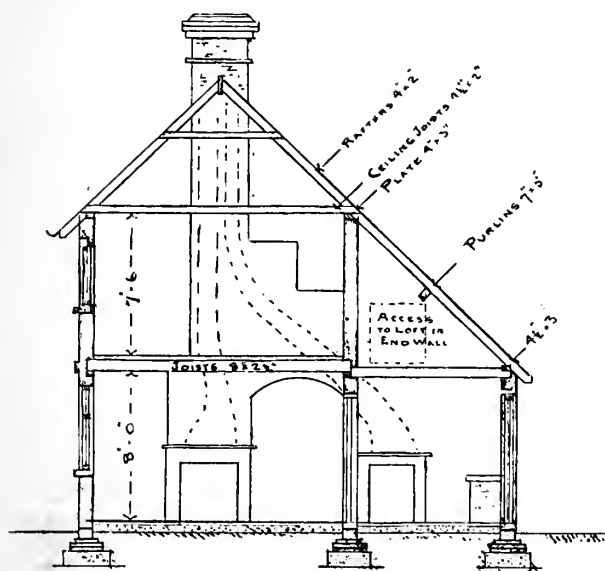


FIG. 18.—Section.

PLAN NO. 4. PAIR OF COTTAGES.



FIG. 19.—Elevation of Outbuildings.

PLAN NO. 4. PAIR OF COTTAGES.

Adding 40*l.* for outbuildings as previously shown, and say 20*l.* for site and fencing-in, the total amount would be 360*l.* This sum is 50*l.* in excess of the other pairs of cottages, but considering the extra accommodation they provide they cost

less per cubic foot owing to the simplicity of their construction, more particularly as regards the roof.¹

The special feature of the design is that in addition to two bedrooms on the upper floor, and the ordinary sitting-room and scullery on the ground floor, a third room is added to this floor for use either as a sitting-room or an additional bedroom as occasion may require. There is a considerable advantage in this, as where there is not a large family it can be used as a parlour or as a bed-sitting-room for a lodger.

On the whole, if expense is not a pressing consideration, this design, in my opinion, is much more serviceable than the others, as the dimensions of most of the apartments are larger. There are some good cupboards, the coppers are placed in the outbuildings, and there is a loft in the roof over the sculleries.

CONCLUSIONS.

Efforts are being made to find out whether cottages cannot be built more cheaply with materials other than brick or stone. Brick is contemplated for the erection of the cottages here designed, except where some stud and plaster work is introduced. It is hardly possible to employ any cheaper material, unless it is corrugated iron. Concrete blocks, uralite, and wire-wove material, appear to be as costly as bricks or stone, where these are obtainable at a reasonable price. A great deal may be said, however, in favour of wooden stud-work (lath and plaster inside and out) where bricks are dear or where stone is expensive to get and work. I have introduced it for the upper storey of one of the plans here shown, and it is very common in the eastern counties. For many years I lived in a house one-half of which was so built, and the other half built of brick and flint, and I am sure the stud and plaster was the drier and more comfortable part of the dwelling, owing to the air space in the walls.

This space or cavity is also an advantage when provided in brickwork, as it often is, by building two $4\frac{1}{2}$ in. walls, with a cavity of 2 in. tied in with galvanized iron ties 2 ft. apart every fourth course; but it adds some 15*l.* to the cost of a pair of cottages. This extra cost could, however, be saved, if the inside plastering of the walls was omitted, as, being hollow, a good face of brick would be obtainable inside as

¹ The Roman tiles are not suitable for dormers or where much cutting is required, as they necessitate lead or zinc valleys.

well as outside the walls, and whitewashing or colouring might be substituted for the plastering.

Unless one is building a "bungalow" or something of a temporary nature, only brick, stone, concrete, or stud and plaster, can be recommended for the purpose of this article, which is to furnish economical designs for cottages of a permanent nature, and for which rent charges for thirty to forty years can, if necessary, be obtained to cover the cost of erection. The minimum cost would appear to be about 300*l.* for each pair of cottages, so far as my experience goes; but this minimum would be increased considerably in some places.

The "Cheap Cottage Exhibition" which it is proposed to hold next summer at Hitchin will, in this connection, be interesting as affording evidence of cost, and as giving other particulars with regard to materials and workmanship. It will also, I am sure, dispel a good many illusions, because a great deal that has been written of late is, to say the least, not the outcome of practical experience on the subject.

No reference has been made in this article to the many structural details connected with cottage building from a fear of occupying too much space. I have preferred to direct the attention of owners to the importance of a full consideration of certain points before determining to build; to give some particulars of the facilities for obtaining money by means of the Land Improvement Acts, which are now more favourable owing to the extension of time for repayment of loans on substantial buildings; and to direct attention to the desirability of a renewal of state loans, to the advantages of the provisions of the Settled Lands Acts for the use of trust money for the erection of buildings, and to the questions of the Building Bye-laws of Rural District Councils, and of local rates as affecting the building of cottages.

Finally, I will emphasise what I have already stated, that the provision of better dwellings will, at the best, be only a partial remedy for rural depopulation. Another help, and in my opinion a very material one, will be to provide large gardens attached to the cottages, and in suitable places a small grass orchard to serve also as a pig-run. These involve only a small outlay, and are aids to a labouring man's income. They afford him interest, pleasure, and some instruction, and undoubtedly assist to make him and his family more contented with country life.

Abberley, Stourport.

A. DUDLEY CLARKE.

THE SOCIETY'S SHOW OF 1904.

THE Society's second Show at Park Royal—the sixty-fifth Annual Show since 1839—was held under the Presidency of the Earl of Derby, K.G., from June 21 to 25, 1904, and represented worthily all departments of British agriculture and live stock. The weather, both before and during the Show, was beautifully fine (only a sharp shower falling on June 25); so that the abnormal difficulties which beset the management in 1903 were absent, and the arduous task of getting the Showyard and exhibits ready in time was accomplished with comparative ease.

Several improvements, which the previous year's experience indicated as desirable, were made in the disposition of the ground. The exhibits were grouped more compactly; additional drainage was undertaken; and the permanent roads were extended.

The accompanying views facing pp. 148 and 151 give a picturesque idea of the Showyard, and of the scenery during the Show. Fig. 1 is a bird's-eye view from the west, reproduced from a photograph taken from the top of the tower at the Western Entrances. Fig. 2 represents the Large Ring, with some of the heavy horses, a companion photograph to that of the cattle given last year.

EVENTS OF THE SHOW-WEEK.

The Show opened in brilliant weather on Tuesday, June 21, and the judging of the live stock and produce proceeded throughout the day. His Majesty The King was successful with exhibits, both from Windsor and Sandringham, his thirty-four entries comprising five horses, twenty-one cattle, and eight pens of sheep. The prizes awarded to the King's exhibits included two third prizes for Shire horses, two first prizes and a third prize for Shorthorns, with the Male Championship, two first prizes and a second prize for Herefords, with the Male Championship, a first and a second for Devon cattle, and one first prize, three second prizes, and one third prize for Southdown sheep, with the Championship and Reserve Championship for rams. H.R.H. Prince Christian visited the Show on Tuesday and Wednesday, and H.R.H.

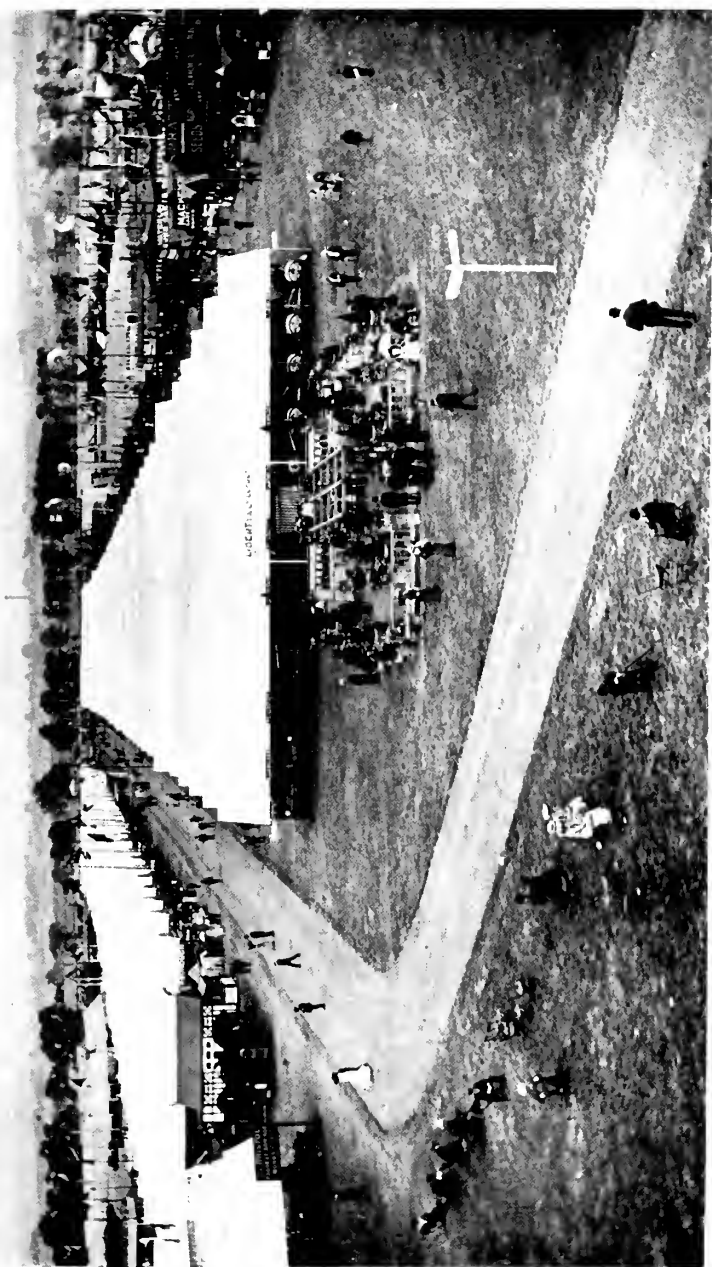
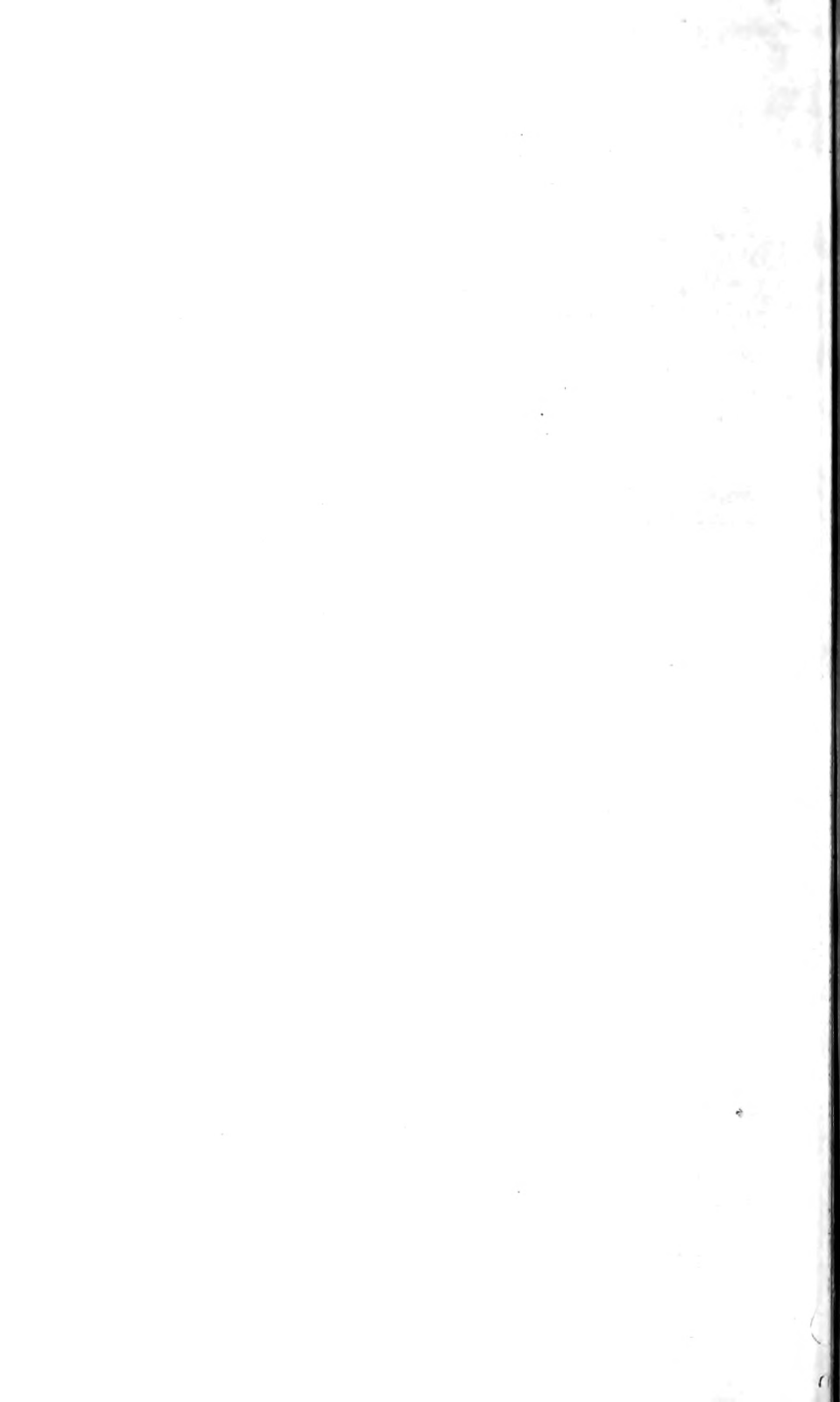


FIG. 1. VIEW OF SHOWYARD FROM THE WEST. PARK ROYAL, 1901.



Prince Arthur of Connaught on Thursday. Distinguished visitors from abroad included, on Tuesday, the Alake of Abeokuta (who was delighted with some of the latest inventions of agricultural machinery), and on Saturday the Crown Prince of Sweden and Norway. Organised parties of Dutch farmers and Belgian agricultural students also visited the Show.

On the second day, Wednesday, June 22, the usual meeting of Governors and Members was held in the large tent, Lord Derby as President occupying the Chair, and afterwards giving the customary luncheon in the Royal Pavilion. The guests included H.R.H. Prince Christian, Mr. Joseph E. Lilley (High Sheriff of Middlesex), the Earl of Onslow (President of the Board of Agriculture), the Rt. Hon. Sir Horace Plunkett (Vice-President of the Irish Agricultural Department), Sheriff Sir Alfred Reynolds, and Col. Fenwick (Royal Horse Guards).

Musical performances were given daily by the Band of the Royal Horse Guards, and on Saturday afternoon in the large ring this Regiment gave a Military Display, which was effectively carried out and highly appreciated.

THE ATTENDANCE.

It was hoped that the Society's Show when established permanently in London would attract agriculturists from the provinces in numbers sufficient, with other visitors from London and its environs, to provide against loss. The first Show of 1903 was held in a locality then quite new and unknown. Although a large sum had been spent in advertising in 1903, it became only too evident that Londoners remained almost wholly ignorant of the existence of "Park Royal" and of the Society's Show. Every effort was therefore put forth this year to make the Show better known in and around London. The actual attendance of the paying public, however, only reached 52,930 persons—an even more disappointing total than that of 1903—and the Society has thus sustained a second heavy financial loss at Park Royal amounting to 6,920*l.* 9*s.* 10*d.*

With a view to attract the attendance of those engaged in London during the day, the price of admission was reduced to 1*s.* at 4 p.m. on each of the two 2*s.* 6*d.* days. The following Table shows the number of admissions at different times during each day:—

Statement of Admissions by Payment at Park Royal, 1904.

Day of Show	11 a.m.	1 p.m.	3 p.m.	4 p.m.	5 p.m.	Day's total
Tuesday (5s.) . . .	495	1,288	1,719	—	1,962	2,011
Wednesday (2s. 6d. ; after 4 p.m., 1s.) . .	1,137	4,219	5,830	6,999	8,678	9,375
Thursday (2s. 6d. ; after 4 p.m., 1s.) . . .	863	3,826	5,837	6,860	9,332	10,912
Friday (1s.) . . .	1,070	5,207	8,898	13,245	—	14,175
Saturday (1s.) . . .	1,390	3,469	7,772	15,559	—	16,457
Total	—	—	—	—	—	52,930

It may be observed that the preceding figures do not include Governors and Members of the Society, who receive free admission to the Show and the Grand Stand as one of the privileges of membership. This year the railway companies granted a valuable concession under which Members travelling to the Show from distances of over thirty miles obtained return tickets at the price of a single fare and a quarter. The reduction was greatly appreciated, and the number of Members present at the Show was a very large one.

THE PRIZE SHEET AND REGULATIONS.

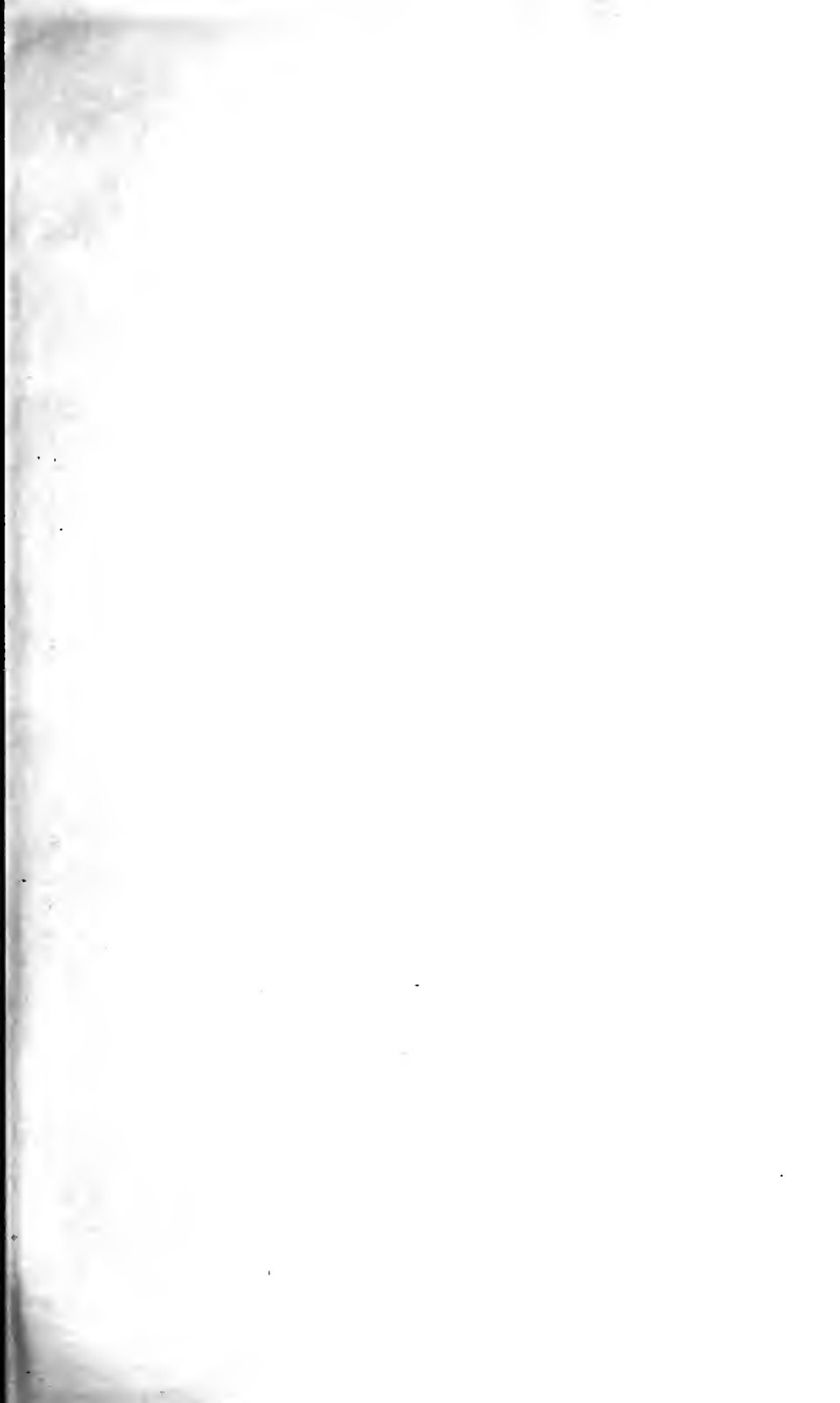
At their meeting held almost immediately after the Show of 1903, the Council resolved that the amount of the prizes to be offered by the Society itself for the Show of 1904 should not exceed 5,000*l.*,¹ exclusive of the Champion and other special prizes of the various Breed Societies. Bound by this limit, the Stock Prizes Committee prepared a prize sheet, which, though it did not reach the proportions of the previous year, yet retained the comprehensiveness essential to an exhibition of national scope. The total value of the prizes offered amounted to 6,112*l.*, of which 1,165*l.* were contributed as Champion and supplementary prizes by the following thirty-one Societies :—

Horses.—Shire Horse, Clydesdale Horse, Suffolk Horse, Hunters' Improvement, Hackney Horse, Shetland Pony Stud Book, Polo and Riding Pony Societies.

Cattle.—Shorthorn Society, Lincolnshire Red Short-horn Association, Hereford Herd Book, Devon Cattle Breeders', Sussex Herd Book, Red Polled, Polled Cattle Societies, English Aberdeen Angus Cattle Association, English Jersey Cattle, Longhorn Cattle, English Kerry and Dexter Cattle Societies.

Sheep.—Oxford Down Sheep Breeders', Shropshire Sheep Breeders' Associations, Southdown Sheep Society, Hampshire Down Sheep Breeders'

¹ Journal R.A.S.E., Vol. 64, 1903. pp. lxi-lxiii.



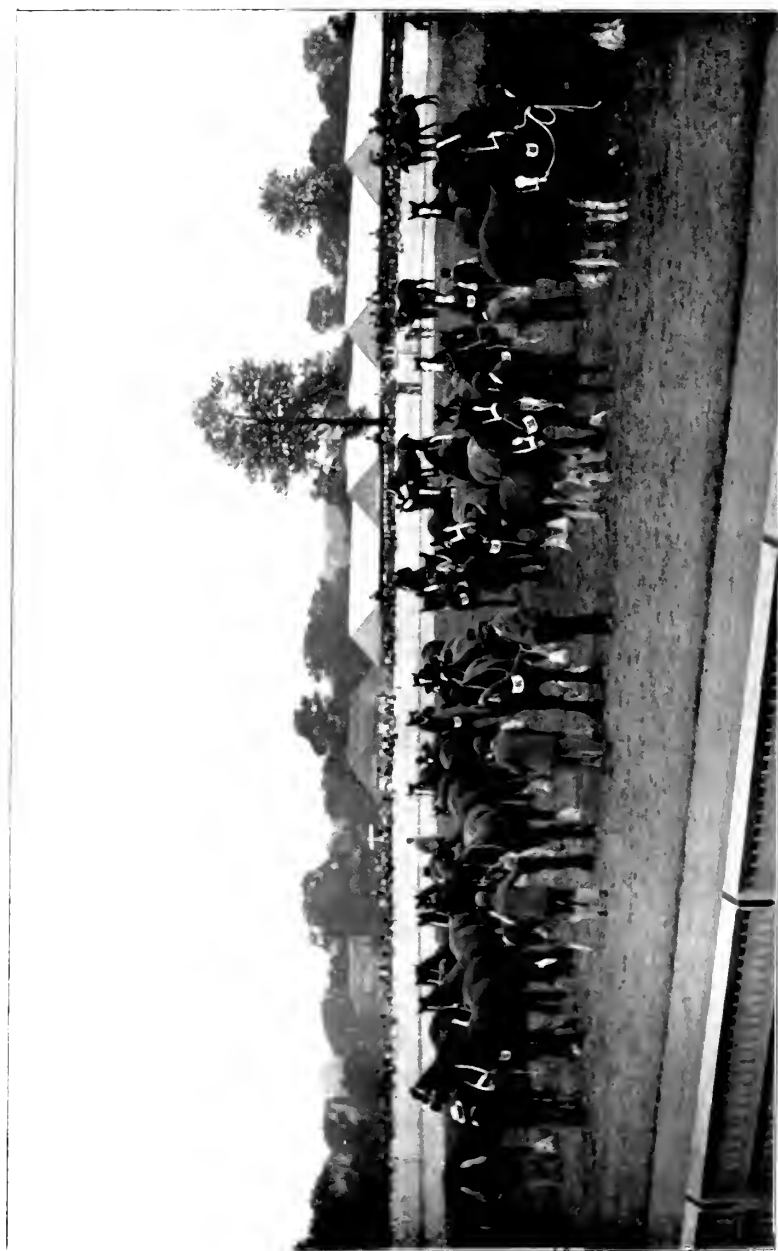


FIG. 2. VIEW OF THE LARGE RING. PARK ROYAL, 1904.

Association, Suffolk Sheep Society, Lincoln Long Wool Sheep Breeders', Kent or Romney Marsh Sheep Breeders', Dorset Horn Sheep Breeders' Associations, Ryeland Flock Book Society.

Pigs.—National Pig Breeders' Association, British Berkshire and Large Black Pig Societies.

Poultry.—Sussex Poultry Club.

A statement showing how the prizes were distributed between the different sections, together with the number of classes and entries, is given on page 152, and may be compared with the similar statement for the Show of 1903 on page 145 of Vol. 64.

Auction sales of the live stock exhibits were again held during the Show, and the prices realised amounted to 5,075*l.* 19*s.* 3*d.*, as compared with 3,272*l.* 12*s.* last year.

In the Implement Department the awards were limited to Silver Medals for "New Implements." A Report on the Miscellaneous Implements exhibited, written by one of the Judges (Mr. J. Broughton Dugdale), appears at page 184.

DESCRIPTION OF EXHIBITS.

The following is a detailed description of the various departments of the Show, based for the most part upon the official Reports of the Judges. Illustrations are given of some of the Champion Horses and Cattle, the breeds selected being those not illustrated in previous Reports in the Journal. Fig. 3 is from a photograph by Mr. W. Platt, of Bolton; Figs. 4-7 are from photographs by Mr. C. Reid, of Wishaw.

HORSES.

The English heavy breeds were, as in 1903; well represented, the Shires with eighty-seven entries and the Suffolks with forty-four. The lighter breeds were disappointingly few, so that the total number of horses only reached 437, as against 475 last year and 521 at Carlisle. The Polo Ponies with sixty-three entries were the most numerously represented light breed.

Shires.—The entries numbered eighty-seven in seven classes. With the exception of the first prize animals, the stallions were not so good, reports the Judge, as one would expect at such an important Show. The mares and fillies were better, especially the brood mares with foals at foot (Class 4). The first prize three-year-old filly (Class 5) was a good one, and the first prize two-year-old filly (Class 6) did great credit to her owner, a tenant farmer. With few exceptions the animals in the other classes were of moderate quality.

STATEMENT OF PRIZES, CLASSES, AND ENTRIES
AT THE SOCIETY'S SIXTY-FIFTH ANNUAL EXHIBITION,
PARK ROYAL, 1904.

HORSES AND CATTLE	Prizes £	Classes No.	Entries No.	SHEEP, PIGS, POULTRY, PRODUCE	Prizes £	Classes No.	Entries No.
HORSES:—				SHEEP:—			
Hunters	221	8	46	Oxford Down	80	4	34
Cleveland Bays and				Shropshire	102	5	56
Coach horses	70	3	28	Southdown	102	5	97
Hackneys	161	6	36	Hampshire Down . .	97	5	66
Ponies	60	3	12	Suffolk	108	6	39
Shetland ponies . . .	66	4	26	Lincoln	135	7	44
Polo and Riding				Leicester	72	4	20
ponies	156	7	63	Cotswold	72	4	—
Harness horses and				Border Leicester . .	72	4	—
ponies	151	7	44	Kent or Romney			
Four-in-hand				Marsh	90	5	49
teams	35	1	6	Wensleydale	72	4	18
Trotting horses . . .	20	1	3	Dorset Horn	82	4	25
Shires	201	7	87	Devon Long-wool . .	36	2	7
Clydesdales	140	6	23	Dartmoor	36	2	6
Suffolks	150	8	44	Exmoor	36	2	6
Draught horses . . .	40	2	19	Cheviot	36	2	9
				Blackfaced Mountain			
				Lonk	36	2	11
Total for HORSES .	1471	63	437	Herdwick	36	2	6
				Welsh Mountain . .	36	2	11
				Ryeland	54	3	12
CATTLE:—				Total for SHEEP .	1426	76	523
Shorthorn	325	9	193	PIGS:—			
Lincolnshire Red				Large White	78	4	48
Short-horn	120	6	28	Middle White	77	4	26
Hereford	141	6	88	Berkshire	77	4	73
Devon	141	6	40	Tanworth	77	4	27
South Devon	40	2	4	Large Black	82	4	53
Sussex	141	6	33				
Welsh	80	4	22	Total for PIGS . .	391	20	227
Red Polled	140	6	55				
Aberdeen Angus . . .	101	4	29	TOTAL FOR STOCK	5261	243	2056
Galloway	80	4	31	POULTRY	225	117	603
Highland	40	2	5	PRODUCE	350	82	544
Ayrshire	40	2	7	COMPETITIONS . .	276	15	243
Jersey	140	7	152				
Guernsey	120	6	60				
Longhorn	70	4	18				
Kerry	76	3	31				
Dexter	76	3	42				
Dairy cows	40	2	3				
Butter Tests	62	2	26				
Total for CATTLE .	1973	84	867				

Grand Totals for LIVE STOCK

POULTRY, PRODUCE, and } £6,112 Prizes . 457 Classes . 3,446 Entries.
 COMPETITIONS.

The Male Championship went to the first prize three-year-old stallion *Intake Albert*, exhibited by Mr. Philo Mills; and the Female Championship was gained by Lord Rothschild with *Blythwood Guelder Rose*, the first prize mare with foal at foot in Class 4.

Clydesdales.—The six classes were small in number with twenty-three entries, and the quality was moderate. The Judge reports that there was little to choose between the three exhibits in Class 8. The first and second prize winners in Class 9 were two nice colts, but of different kinds, the first showing more quality. Class 10, with four exhibits, was probably the best in the male section. The first prize was gained by the Duke of Leeds with a dark-brown colt of big size. The second was gained by a black colt which was not shown in great form, but which looked like making a nice horse. Amongst the females, the first prize winner in Class 12, for three-year-olds, was easily found in a dark-brown very big filly, which was shown in fine form combined with nice quality.

The Male Championship awards were both gained by Messrs. A. and W. Montgomery for *Refiner* and *Baron Alister*, respectively. The Female Champion was Mr. Fenwick Wilson's filly, the first prize animal in Class 12 referred to above; and the Reserve Female Champion was Mr. Thomas Smith's *Baroness Burgany*.

Suffolks.—The entry was above the level of former years, numbering as many as forty-four animals in eight classes. The prizes in two of these, viz., the classes for stallions foaled in or before 1900 and geldings foaled in or before 1899, were provided by the Suffolk Horse Society.

The Judge (Mr. Horace Wolton) reported as follows :—

In Class 14, for stallions foaled in or before 1900, were four good representatives of the breed, affording the public an opportunity of seeing the Suffolk in his developed form, symmetrical and compact. Conspicuous amongst them was Mr. Alfred Smith's *Saturn*, a grand eight-year-old, the winner of Champion and many first prizes. The second prize went to the Rev. H. Taylor's five-year-old *Court Fop*, also a typical Suffolk. The three-year-old stallions (Class 15) formed a nice collection, and here again were winners at previous important exhibitions, including another entry by Mr. Alfred Smith, *Rendlesham Saint*, a worthy son of the well-known sire, Prince Albert, which was placed first. Second honours were awarded to Mr. R. Eaton White's *Boulge Monarch*, a very promising "Prince Wedgewood" colt.

Class 16, stallions foaled in 1902, was a remarkably good one of 14 entries, representatives of the best-known studs in the country being in the ring. In such excellent company, the champion at the last Show of the Suffolk Agricultural Association, Mr. A. Gerald Smith's *Pilate* by "Wedgewood," again came prominently to the front; he is a very fine animal of good size and quality, nice colour, and grand action. Mr. Gerald Smith is to be congratulated, as a comparatively young exhibitor, upon having been able to produce what is generally regarded as the finest Suffolk of the day; but it is not to be forgotten that this gentleman's early training was amongst the best examples of the breed. Mr. Alfred Smith's *Rendlesham Sorcerer*, a "Prince Albert" youngster, was second in the class, a distinction he richly deserved in a competition as keen as this was. Indeed, he ran the winner very closely and may make

the better animal, being long, low, and wide, with plenty of bone and quality. Having regard to the high character of the exhibits generally, it is worthy of mention that Mr. R. Eaton White's *Boulge Pluto*, a son of "Saturn," was third.

There were but three present in Class 17, yearling stallions. Another exhibit belonging to Mr. A. Gerald Smith took the lead, *Protest*, which promises to make a very superior horse, as good, if not even better, than his brother, *Pilate*. Class 18, mares with foals at foot, numbered only four, but they were high-class animals. *Bawdsey China Doll*, belonging to Sir Cuthbert Quilter, maintained the position she took at the Suffolk Show, the second prize going to Mr. R. Eaton White's *Boulge Hebe*. Three-year-old fillies numbered five, and here two entries from the Bawdsey Manor Stud, *Ramsholt Princess* by "Prince Wedgewood," and *Bawdsey Ruth* by "Golden Grain," secured first and second respectively. Mr. Gerald Smith's *Wisdom* by "Prince Albert" took the lead (as at the Suffolk and Essex Shows) as a two-year-old filly (Class 20), the second prize going to another daughter of "Golden Grain," Mr. John Symond's *Diamond*. The display of geldings was a highly creditable one, the competing animals being of good size, well shaped, and built for strength. Sir Cuthbert Quilter's *Nelson*, not a stranger to the prize ring, was first, while a worthy stable companion, *Bowler*, took second.

Draught Horses.—This was a one day's exhibition of mares or geldings not in harness (Class 22), and of mares or geldings worked within a radius of eight miles from Charing Cross, shown in harness without vehicles (Class 23). The former class, with eight entries, contained four very good animals. The first prize was gained by Mr. A. C. Sparkes with "quite an extraordinary gelding," *Oldfield Duke*. The other class had eleven entries, and those judged were all useful, but not first rate. The animals were well brought out and most creditable to the men in charge.

Hunters.—Eight classes were provided, but in two of them there were no entries. The entries in the remaining six classes numbered forty-six. The heavy-weight hunters (Classes 24, 25, and 29) were judged by Lord Southampton, whose report, after commenting upon the short entry, proceeds as follows:—

In all three classes there were at least two distinctly good animals, the first two brood mares (Class 24) being particularly good ones, and, in my opinion, quite the right sort to breed weight-carrying hunters by a thoroughbred horse. But this was the worst class in point of numbers, and the other mares were not in the same class in point of merit as the first two. The three-year-old fillies (Class 25) were the best class all through that I had to judge. Most of the animals were up to the mark and looked like growing into useful hunters. The winner was, in my opinion, too fat for a growing young animal. Of the ridden horses (Class 29), there were not more than four worthy of any consideration, the first three being quite useful. There was one other useful horse, but he was too stale. These four gave the impression that they should be serviceable horses out hunting; among the others were two that could not by any possibility be so.

The Champion Gold Medal offered by the Hunters' Improvement Society for the best mare of four years and upwards was awarded to Lord Middleton for *Ladylike*. A portrait of this animal, with her foal, appears opposite (Fig. 3).



FIG. 3. HUNTER MARE, "LADYLIKE."

Winner of the Champion Prize for best Hunter Mare, Park Royal, 1904. Exhibited by LORD MIDDLETON.



The light-weights (Classes 26, 27, and 31) were also few in number. They were judged by Mr. T. L. Wickham-Boynton, who remarks that they were weak in merit, with the exception of one or two animals in each class. The two-year-old fillies (Class 26) were on the lighter side. The winner was a nice quality filly that moved truly and well; the second prize winner, though stronger, moved very badly in her walk. The yearling fillies (Class 27) were only five in number. The first prize winner was a strong, well-grown filly, not a good walker, but an easy winner. The second and third prize winners were both nice quality animals and moved well, but were rather light. Though only five horses competed in Class 31, for geldings, they all showed considerable merit. The first prize winner is a "charming light-weight hunter with the best of manners"; the second prize horse "would press the winner very close indeed if his manners were equally good." The Gold Medal for the best filly not exceeding three years old was gained by Mr. F. B. Wilkinson for *The Lady*, which won easily.

Cleveland Bays and Coach Horses.—These were shown together in three classes, producing twenty-seven exhibits, of which twenty were Cleveland Bays and seven Coach Horses. The stallions foaled in 1901 or 1902 (Class 32) were of great merit, the prize winners being "horses of class, action, and quality." Class 33, for mares with foals at foot, made a typical exhibit of seven entries. The fillies (Class 34) were considered by the Judge as the best of the section, and the first prize animal was "one of the best of its kind."

Hackneys.—These numbered thirty-six in six classes, and included some choice animals. The Male Championship was awarded to Sir Walter Gilbey's *Kirkburn Sensation*, a son of "Rosador," and the Female Championship was gained by Mr. Stephen Cliff with *Crayke Czarina*, a two-year-old filly.

Ponies.—The section numbered twelve in three classes. Four pony stallions (Class 41) appeared in the ring. The first prize went to a very smart four-year-old "with exceedingly fine true action and of nice pony character." The second was also a very good mover, but hardly of the quality of the first. The third prize animal did not show the same pony type, being more of the dwarf Hackney character. The first prize mare in Class 42 is described by the Judge as "a real nice pony, beautifully made, with good action"; the second, an aged mare, shows great constitution and has fine action. The third is a

very nice type, but has more the action of a polo pony. The winner in Class 43 was a beautiful filly full of quality and with capital all round action, and the second was a good mover with more power and truer action than the third prize animal.

Shetland Ponies.—These were represented by twenty-six entries in the four classes. The stallions (Class 44) numbered twelve, and the Judge reported that the class in point of numbers and quality excelled that of any other Show of these ponies that he had seen. The similarity of type was very marked, and no small difficulty was experienced in placing the ponies. Ultimately the first prize was awarded to Mr. R. W. R. Mackenzie's *Bellman*, "a perfect specimen of the breed, possessing both substance and quality." This pony also received the Champion Silver Medal offered by the Shetland Pony Stud Book Society, and its portrait appears opposite to this page (Fig. 4). The next (Class 45) contained but two exhibits, but both animals were of good quality. Class 46 contained five mares, the first prize, "a typical specimen of the breed," being gained by Mr. Walter Aitchison with *Strawberry*, which also carried off the Champion Silver Medal for the best Shetland mare or filly (see Fig. 5 facing page 158). In Class 47 there were five fillies. The Judge had no difficulty in giving the first prize to Mr. William Fawcett's *Midget*, which he describes as "a very handsome and wonderfully matured yearling." The second and third prizes were gained by *Patti* and *Victoria*, "two very sweet ponies showing great quality," exhibited by the Ladies E. and D. Hope.

Polo Ponies.—This section shows a further increase in numbers, the seven classes containing sixty-three entries, as against fifty-six last year. Sir Humphrey de Trafford, who acted as Judge, considers that the classes were of most excellent merit, hardly a moderate animal having been exhibited throughout. Classes 48 and 50, for stallions not above 14 hands 2 inches and mares between 13 hands 2 inches and 14 hands 2 inches, with foals, were of exceptional merit. These classes produced the Champion animals, Mr. John Barker's stallion, *Antre*, and mare, *Black Bella*.

Harness Horses and Ponies.—These comprised seven classes, three for single harness and four for donble harness, all judged and paraded on single days during the Show. The entries in the seven classes totalled forty-four. Classes 55 to 57, for mares and geldings of any age, were exhibited on Tuesday, June 21. In Class 55, for animals of 15 hands 2 inches



FIG. 4. SHETLAND PONY STALLION, "BELLMAN," 1192

Winner of Champion Prize for best Shetland Pony Stallion or Colt, Park Royal, 1904. Exhibited by Mr. R. W. R. MACKENZIE.



and upwards, the first prize, with the Reserve Championship, was taken by Mr. R. W. Jay, for a six-year-old chestnut gelding, *Towthorpe*, which "had his youth to thank for gaining that place, he being hardly pressed by the second prize horse." This was Miss Ella Ross's *Rowton Blackthorn*, the black ten-year-old gelding, which gained the first prize in the corresponding class last year. Class 56, for horses under 15 hands 2 inches, was headed by Mrs. Batt's *Heathfield Squire*, which thus improved its position of second prize last year. This horse, a pure-bred Hackney gelding, also gained the Championship, a Gold Medal offered by the Hackney Horse Society for the best animal in Classes 55 to 57, the produce of a registered Hackney stallion. "He stood out prominently," remarked the Judge, "from all competitors, both in shape and action." The second prize, a Hackney, sired by "Royal Danegelt," is described as "a nice horse moving with great freedom." The third prize winner was also a "light and easy goer, though somewhat deficient in force." Only one pony mare appeared in Class 57, but it was a very good one and received the first prize. Classes 58, 59, and 60, for mares or geldings in double harness, were exhibited on Wednesday, June 22. Class 58, for pairs of 15 hands 2 inches and upwards, attracted seven entries, the prizes being divided between Miss E. K. Cunliffe and Miss Ella Ross. Class 59 was similar to the preceding, except that first and second prize winners at the Royal Dublin, Hackney, Yorkshire, Peterborough, and Richmond Shows were ineligible. There was only one entry, which received the first prize. Class 60, for pairs under 15 hands 2 inches, contained five entries, and the prizes were gained by Mrs. Batt, Mr. John Kerr, M.P., and Mrs. Chichester, in the order named. Class 61, for mares or geldings of any height, driven tandem, attracted five entries, and Class 62, for four-in-hand teams, six entries. They were judged and paraded on Thursday, June 23. On Friday, June 24, a trotting competition for mares or geldings of any age or height, driven in a buggy or sulky against time, took place. Mr. Louis W. Winans was the only competitor with his three horses, *Charlie B.*, *Tom Nolan*, and *Passing Belle*. Two of these animals gained prizes at Park Royal last year.

Horse-Jumping Competitions.—These were held each afternoon in the large ring under the usual conditions. The prizes amounted to 160*l.*, which, in addition to the entry fees, were divided amongst the prize winners. The competitors numbered

forty-one. There were one or two nasty falls during the week, and one rider had the misfortune to break his collar-bone, but happily the injuries sustained were not permanent.

Bending, &c., Competitions.—Prizes amounting to 35*l.* were offered in three classes for Bending and "Handiest Pony" Competitions. In the Bending Competitions the competitors had to go up and down eleven posts eight yards apart, using one or both hands at option, but carrying a stick. If the post fell to the ground the competitor was disqualified. In the latter various tests were applied by the Judges. The prize winners were Mr. John Barker, Mr. Harry Rich, and Messrs. H. and F. Rich.

CATTLE.

Although not equalling last year's record entry of 944, the cattle made a fine display of 867, the Shorthorns leading with 193 entries. Jerseys, the only other breed with a three-figure total, came next with 152 entries.

Shorthorns.—This year's entries for the premier breed of cattle numbered 193, a total only once previously exceeded, viz., at Windsor in 1889 when there were 222 entries and 198 animals present. The classes were increased to nine, and included three in which the prizes were provided by the Shorthorn Society, in addition to their usual Champion prizes and a prize of 5*l.* to the breeder of each first prize animal.

The Champion Bull was found in *Ronald*, a three-year-old, exhibited by H.M. The King, from Windsor. Lord Calthorpe's *Elvetham Conqueror* was Reserve Champion. Mr. J. Deane Willis took the Female Championship with *White Heather*, a beautiful cow that was Reserve last year to H.M. The King's *Sylph*. The Female Reserve Champion fell to Mr. Herbert S. Leon for *Roseleaf*.

Mr. William Wright judged the three male classes, and made the following observations on the prize winners:—

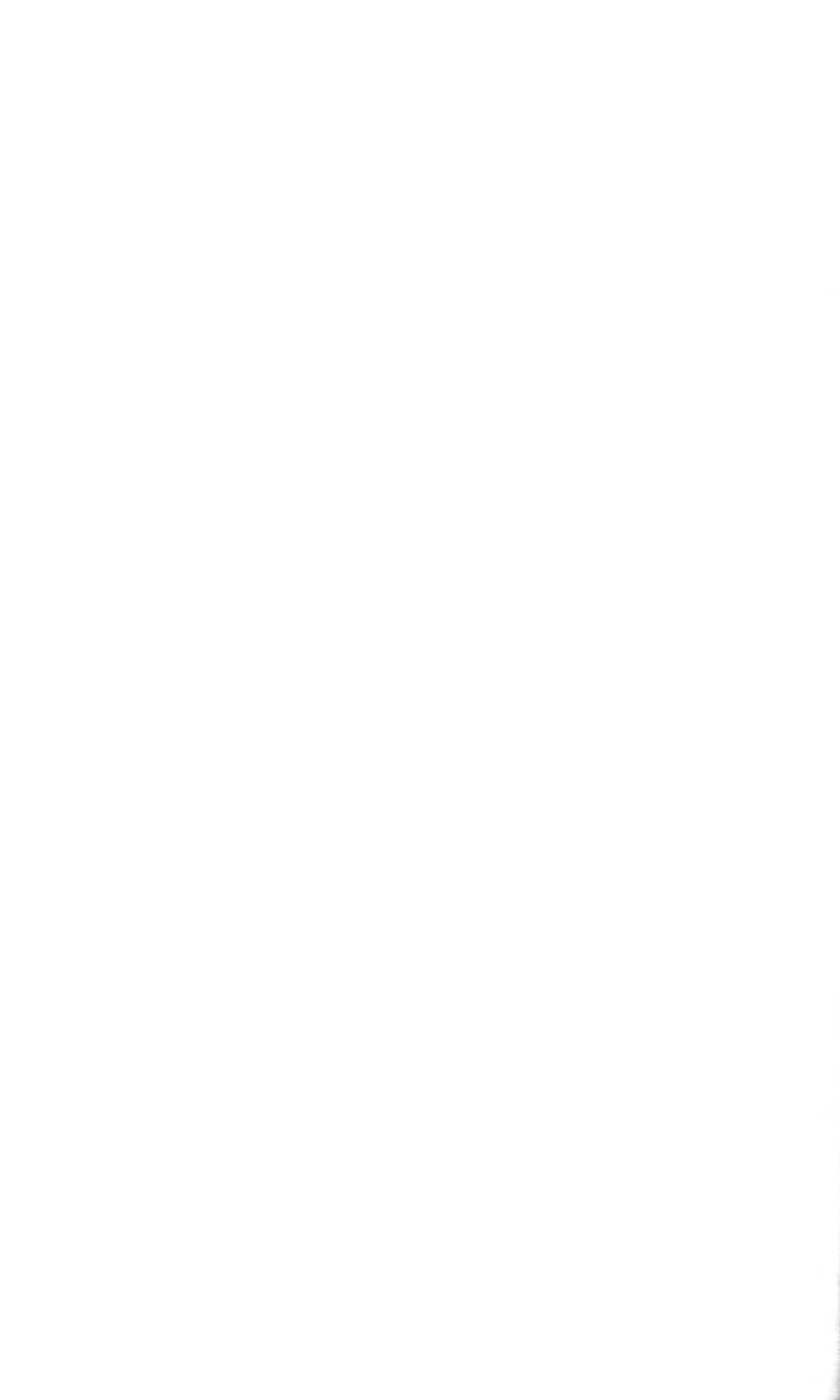
CLASS 64 (Bulls calved in 1900 or 1901).—23 entries. No. 366, the first prize, is an easy winner. His head is perhaps his worst fault, but back, shoulders, and middle are pretty near perfection, and he is a very level bull all over. No. 367, the second prize, is eight months younger, and consequently not so massive. He is a very level made bull, but has not a good Shorthorn head and horns. No. 387, the third prize, is thickly and evenly fleshed, but is not good in the hind quarters and is rather wanting in character.

CLASS 65 (Bulls calved in 1902).—29 entries. No. 399, first prize, is an easy winner. He is deep and good looking with a good top and underline and very good touch, but too narrow in the hind quarters. No. 393, second prize, is good looking with nice coat and fore quarters, but faulty behind. No. 400, third prize, is a big-grown, evenly fleshed bull and one that looks like improving.



FIG. 5. SHETLAND PONY MARE, "STRAWBERRY."

Winner of Champion Prize for best Shetland Pony Mare or Filly, Park Royal, 1904. Exhibited by Mr. WALTER AITCHISON.



CLASS 66 (Bulls calved in 1903).—36 entries. This large class contained some good young bulls. No. 423, the first prize and Reserve for Champion, is a very gay young bull, straight, deep and level, and looks well both when walking and standing. No. 439, second prize, is a thick good bull, but not equal to the first prize winner in hind quarters and does not walk nearly so well. No. 443, third prize, is a very promising young bull, good looking, and straight.

The show of female Shorthorns, for which six classes were provided, bore very favourable comparison in regard to individual merits with the exhibits of former years. The younger classes, in particular, were well and numerous filled and contained several promising youngsters. Indeed, the two chief competitors with Mr. Willis's cow, *White Heather*, for Championship honours were the first prize animals in the yearling and two-year-old classes. The beautiful mould of the older animal and her maintenance of true and level form, despite the trials of Show training and of calf breeding and milking, and her typical head, gave her an advantage over her younger competitors, which have each yet to risk the trials of age and breeding.

Mr. F. Punchard, who judged these classes, proceeds as follows :—

CLASS 67 (Cow, in-milk, calved previously to or in 1900 : 11 entries).—The competition lay chiefly between *White Heather* and *Lady Sybil*, the latter having a very level frame and showing good milking capacity, but with a less beautifully moulded head than her more successful competitor. *Countess of Oxford* 16th, the winner of the third prize, was perhaps heavier in front, but her somewhat drooping quarters prevented her getting higher honours.

CLASS 68 (Heifer, in-milk, calved in 1901 : 12 entries).—The competition for honours was a more even one, and required careful discrimination in awarding the prizes, especially as the milking properties in some of the animals were not as well developed as is nowadays desired in the dams of our future stock bulls.

CLASS 69 (Heifer, calved in 1902 : 21 entries).—This class had many promising youngsters in it. *Roseleaf*, however, was easily first, as her long, deep, and heavily fleshed frame, and unusually great girth, fully entitled her to premier honours. But for a trifling weakness in the back—a defect more or less discernible in sundry of her competitors in the class—she might have succeeded in the Championship honours. *Yours Faithfully*, a well-moulded white of great depth, and with level top and underlines, was a good second ; whilst the excellent quality and frame of *Duchess* 136th thoroughly maintained the once high repute of the family from which she is descended.

CLASS 70 (Heifer, calved in 1903 : 40 entries).—This class was the most numerously filled, and in some respects the best class in the Show. *Lady Amy* 7th, a beautifully moulded and most promising heifer, was at once picked out as first. She will probably be a formidable competitor in future years for Championship and other honours. The main competition arose in the award of secondary and other honours. Here the possibilities and probabilities of future development into truly well-framed matrons had to be considered against highly forced but smaller carcasses. The award of four high commendations and five commendations in the class testify to an appreciation of the high qualities and promising points exhibited by the several competitors.

CLASS 71 (Dairy Cows, in-milk, calved previously to or in 1899 : 12 entries).—This class had some fairly typical specimens of the dual purpose

cow, though there is still room for the more perfect moulding of the udder. There is, however, an improvement in this respect compared with former years. Class 72 (Dairy Cows, calved in or after 1900: 9 entries) was rather defective in this particular, and where a good-shaped udder did appear, it was attached to a somewhat small or light frame, devoid of the essential capacity for beef production. A combination of frames such as those of the first and second prize animals, with square, well-shaped, and capacious udders, is much to be desired, and would result in the much demanded dual purpose animal. A continuance of the classes may give great encouragement in that important direction.

Lincolnshire Red Short-horns.—The six classes contained twenty-eight entries. Although the entries were not large, the Judge considers that the quality of the animals exhibited was of the best. Every class except the old bulls (Class 74) was filled with animals of superior merit and showed more even frames and true Lincolnshire Short-horn type than has before been seen at the Royal. The female classes were exceptionally good. The old bull class was the weakest: the younger classes of bulls were excellent.

Herefords.—The six Hereford classes, which produced eighty-eight entries, as against seventy in 1903, revealed, on the whole, a general average of high merit. They were "heavy fleshed, level in shape, and true to type. The younger animals were not too fat for breeding purposes." There were three competitors in Class 79 for the old bulls, and, as last year, the first prize, together with the Male Championship, was gained by His Majesty The King for *Fire King*, an animal "stylish in character, level in shape, with great wealth of flesh, and possessing all the best attributes of the breed." Mr. Peter Coats was second with *Holmer*, and received the Reserve Championship: the two animals thus occupying the same respective positions as last year. The last-named animal is described as "only a shade less meritorious than *Fire King*." Of the ten competing two-year-old bulls (Class 80) eight were noticed. The yearling bulls (Class 81) numbered twenty-eight, and were of "high average excellence." The first two prize winners were of "very equal merit." Class 82, for cows and heifers, was a good one, containing the Female Champion, Mr. John Tudge's *Shotover*, "a grand breeding heifer." Class 83, for two-year-old heifers, was headed by Mr. Richard Phipps with *Nonsuch*, "an animal of exceptional massiveness and quality, but her head was not quite a perfect type of her breed." She was Reserve Female Champion. The remaining class (84) was a good one of yearling heifers. The winner is a "square well-made heifer, with a wide level back and quarters." The

second prize winner, a younger animal "with a wide level top, promises to make a superior breeding cow."

Devons.—The entries numbered forty in six classes. Class 85 (bulls calved in 1900 or 1901) contained only three entries; but the first prize bull, Mr. J. C. Williams' *Drosera*, also gained the Male Championship. He is "an exceptionally fine bull, hard to beat." The second prize bull is also a good strong one. Class 86, for two-year-old bulls, was a very even one, headed by Mr. Williams' *Ficus*, which had already won several prizes this year. The second and third prize animals are "good useful stock bulls." Class 87, for yearling bulls, contained ten entries, Mr. Williams' *Mistletoe*, "a very shapely youngster," leading, and taking the Reserve Championship. Mr. S. Kidner received the second prize for *Bickley Quaker*, "a large sized yearling, not so well moulded as the first prize bull, but with many good qualities." Mr. Skinner's *Pound Royal*, placed third, is "nice to the touch and walks well." Amongst the females, the Championship was taken for the second time by the Messrs. Tribble's *Fern of Hulsdon*, of which a portrait was given in the last Volume. The heifer, *Hestercombe Leaf*, exhibited by Mr. B. C. Shepherd in Class 89, for two-year-olds, is "one of the best seen in the Show-ring for many years," and was Reserve Number for the Championship. H.M. The King's smart heifer, *Ruby*, was second in this class, and was followed by Mr. Skinner's heavy-fleshed *Pound Curly 5th*. H.M. The King received the first prize for *Dewdrop* in a well-filled class of yearling heifers (Class 90), and the second and third prizes were both gained by Col. A. F. Walter.

South Devons.—The bull class (91) was cancelled owing to insufficient entries, but the four cows (Class 92) were all typical of the breed.

Sussex.—An entry of thirty-three in six classes did not quite equal last year's show. There were no Champion Prizes for the breed, but the Sussex Herd Book Society provided special prizes of five guineas each to the winners of the first prizes in Classes 94, 95, 96, and 98. The bulls (Class 93) were six in number, and were headed by last year's champion, *Lord Comp*, No. 723, a "very typical bull"; the second, No. 724, "a bull of substance and quality, but rather too dark in colour"; the third, No. 719, "a useful bull of large type." The two-year-olds (Class 94) were useful bulls. The first prize and the special prize were awarded to the Earl of Derby for *Mayor*.

Four competitors appeared in Class 95. The first prize with the special prize went to Mr. C. J. Lucas, for No. 731, *Lord Eric*, "a yearling bull of very nice quality and colour." Class 96, for cows or heifers calved before or in 1901, was a very good one of five exhibits, all placed. The first, No 740, which also received the special prize, went to Mr. Gerald Warde for *Gaiety Girl 2nd*, "a cow of beautiful quality and style." Class 97 contained two good two-year-old heifers in Nos. 745 and 744. The first prize yearling (Class 98) which also gained the special prize was Mr. Gerald Warde's *Gaiety Girl 6th*, No. 751, "a really very nice heifer of true Sussex type."

Welsh.—No Champion Prizes were offered for this breed as last year, and the entries numbered twenty-two in the four classes. The Judge remarks upon "a great improvement all along the line." He notices favourably all the prize winners, and gives particular praise to Class 102, for young heifers, all being of considerable merit and true to type. Lord Harlech took the first prize in Class 99 for *McKinley*, a four-year-old bull described as "a splendid animal of great scale and true to type." Mr. R. M. Greaves was again most successful, and took all the first prizes in the other three classes.

Red Polled.—The entries were exactly the same in number as last year, viz., fifty-five in six classes. Only three aged bulls (Class 103) came into the ring, the first prize animal, Sir Walter Corbet's *Albert* being an easy winner and taking also the Male Championship. Class 104 was a nice one of ten two-year-old bulls, the first two being "very even in shape and of excellent quality." The first prize bull, Mr. John Hammond's *Davyson 244th*, was Reserve Male Champion. Class 105, for yearling bulls, contained a very second rate lot of animals. The first prize winner was a useful young beast, fairly even, but there was no outstanding winner. In Class 106, for cows or heifers, in-milk, three grand beasts came into the ring, the first prize winner, Mr. John Hammond's *Davy 204th*, being very closely followed by Lord Amherst of Hackney's *Popsey 6th*. These two animals were winners respectively of the Female Championship and Reserve Championship. The first prize winner in Class 107, for two-year-old heifers, was a "beautiful beast of fine quality, but perhaps a little small." The class was a useful one on the whole. Class 108 was a strong one of fifteen useful young heifers. Taken as a whole, the Judge described the Red Polled Cattle as "very good."

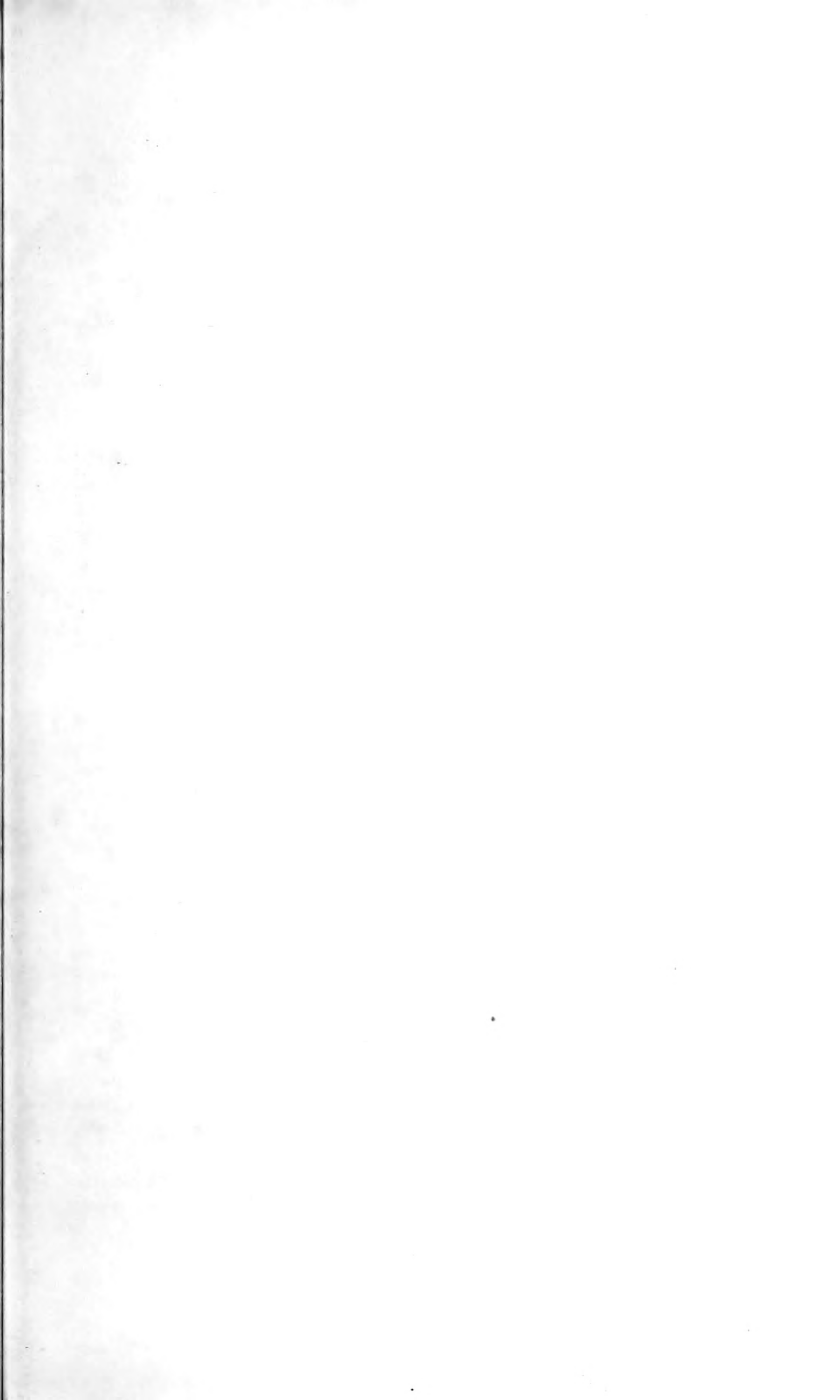




FIG. 6. ABERDEEN ANGUS COW, "EFFULGENT OF DANESFIELD." 28617.

Winner of Champion Prize for best Aberdeen Angus Cow or Heifer, Park Royal, 1904. Exhibited by Mr. R. W. HUDSON.

Aberdeen Angus.—The entries numbered twenty-nine in four classes. The Judge reported that “the older class for bulls, although not large in numbers, comprised a few very meritorious animals—in fact, the three leading animals would have stood well forward in any show of the breed.” The younger class of bulls was not so good, and there were few, if any, outstanding animals in it. This, in a measure, might be accounted for by the fact that many first-class bulls were practically excluded by the age limit. The cow classes were small, but very good. Heifers were a large class, but were not so meritorious as the cows. Mr. R. W. Hudson gained both the Male and Female Championships, with his two-year-old bull, *Knight of Danesfield*, and his cow, *Effulgent of Danesfield*, a portrait of the latter being given opposite as Fig. 6. The Reserve Champion bull was *Wizard of Maisemore*, shown by Mr. J. J. Cridlan, and the Reserve Champion cow was *Darling of Haynes 2nd*, shown by Mr. W. B. Greenfield.

Galloways.—The four Galloway classes contained thirty-one entries, and the whole made a most creditable display. The aged bulls (Class 113) were four very fine animals, more especially the two first. These “would be hard to beat in any showyard.” The young bulls (Class 114) were of fair average quality. The cows in-milk (Class 115) were very good, particularly the first three, which were of quite outstanding excellence. The heifers (Class 116) made a very fine class, the two first animals being of high merit.

Highland.—The class for bulls had to be cancelled owing to insufficient entries. The four animals exhibited in Class 118, for cows or heifers in-milk, were of good quality, but with “no animal of outstanding merit amongst them.”

Ayrshires.—These likewise consisted of only female animals, the male class being cancelled. The entries numbered seven, and were excellent as a whole, the prize winners being of great merit.

Jerseys.—As last year, this breed had seven classes allotted to it. The entries numbered 152, as compared with 186 in 1903. The Judge reported that the first and second prize winners in Class 121, bulls calved in 1900 or 1901, were excellent in every way, and that the third prize and reserve number were two very useful animals, but the class on the whole was not an especially good one. Class 122, for two-year-old bulls, was better; the first prize animal “showed quality and style” and was “quite of the right shape.” The class

was a fair one on the whole. Class 123, for yearling bulls, was a very large one of twenty-three competing exhibits, but their quality was hardly so good as it should have been. There was little to choose between the first and second prize animals, both being very nice bulls, and there were four other very useful animals. The Judge reported that the cows in-milk (Class 124) were good, though he had seen better. The cows in-milk, bred in Great Britain or Ireland (Class 125), the prizes for which were provided by the English Jersey Cattle Society, contained four very good animals, which would have been seen to better advantage if they had been "allowed more field and less stable." The heifers in Class 125 came out strong and made a good show for milk. Some of the animals "could have done with more constitution." The heifers in Class 137 were good, and there were very few indifferent animals.

Guernseys.—The six classes contained sixty entries. The old bulls (Class 128) were well represented, and amongst the two-year-old bulls (Class 129) some excellent specimens of the breed came forward, notably the first and second prize winners. In the yearling bulls (Class 130) a number of very promising animals were exhibited. The first and second prize cows (Class 131) were almost perfect as dairy animals, and won somewhat easily. The two-year-old heifers (Class 132) were weak, the third prize being withheld.

Longhorns.—Seventeen animals were exhibited in the four classes. The first and second prize bulls in Class 134 (calved in 1900, 1901, or 1902) were described by the Judge as being "good representatives of the breed." Class 135, for yearling bulls, was a useful one, the prize animals being very good. The prize cows in Class 136 were good specimens of the breed. The first prize heifer in Class 137 was a "superior animal and in good condition."

Kerries and Dexters.—The three Kerry classes were well filled with thirty-one entries, and contained many excellent animals, and might be considered as a very satisfactory exhibition of the breed. The Duchess of Newcastle gained the Male Championship in the class for old bulls (Class 138) with *La Mancha Gordon*, "a specially fine animal in every respect, and shown in splendid condition" (see Fig. 7 opposite). The second prize animal in this class was also a very good specimen of the breed, and well shown. In Class 139 the third prize cow and the reserve number were good animals, showing dairying



FIG. 7. KERRY BULL, "LA MANCHA GORDON."

Winner of Champion Prize for best Kerry Animal, Park Royal, 1904. Exhibited by THE DUCHESS OF NEWCASTLE.



properties, and the class was a good one on the whole. Sir Gilbert Greenall took the Reserve Championship with *Aicme Cold*, the first prize cow in this class. Several of the heifers in Class 140 were too coarse and fat, those gaining the prizes being very much superior to the others in every respect, especially the first prize animal, which was an exceedingly nice heifer. With regard to the Dexters, totalling forty-two entries, the Judge reported that, although on one or two occasions he had judged better animals, the three classes made on the whole a very good exhibition. The Male Championship was gained by Mr. G. J. B. Chetwynd with *Don Gentian*, a two-year-old bull exhibited in Class 141. Both this and the second prize animal were "very grand typical Dexters. One or two of the other animals were rather too coarse in the head and horns." The cows and heifers in Class 142 were good ones, with the exception of one or two that had badly formed udders. The first three animals were very equal in point of merit. The Judge reported that he was very well satisfied with the heifers (Class 143), and with regard to the first prize animal (No. 1203), *La Mancha Love Game*, exhibited by Mr. R. Tait Robertson, stated that one "rarely finds such a well-developed animal in a heifer class. Her bag is perfection, with most symmetrical teats, well developed and properly set; and in addition to this she has good shape, and should make one of the best Dexter cows on the lines of the celebrated 'Old Red Rose.'" The second prize in this class was also gained by the same exhibitor with No. 1202, *La Mancha Little Highness*, a "sweet little heifer, her weak point being her falling off behind." No. 1192 was also a "nice animal, but unfortunately her teats were too close together."

Dairy Cows.—Prizes awarded by inspection were offered in two classes (144 and 145) for cows exceeding and not exceeding 900 lb. live weight, of any age, breed, or cross, and not eligible for any other classes. Only one cow, a Short-horn, came forward. The Judge awarded it the first prize, and reported that the animal was "a big well-fleshed red cow with a capital udder, and likely to win in any company."

Butter and Milk Tests.—Prizes for dairy cows judged by butter tests (Classes 146 and 147) were offered under conditions similar to those of last year.¹ The prizes were awarded by points according to the following scale: one point for every ounce of butter; two points for every completed ten days

¹ Journal R.A.S.E., Vol. 64, 1903, pp. 159, 160.

since calving, deducting the first forty days. Maximum allowance for period of lactation, twenty-four points. Fractions of ounces of butter and incomplete periods of less than ten days were worked out in decimals and added to the total points. The English Jersey Cattle Society again provided half of the prize money, and also its Gold, Silver, and Bronze Medals for English-bred pedigree Jerseys, the Medals being this year supplemented by Certificates of Merit. The Certificates were awarded for Jersey cows entered or eligible for entry in the English Jersey Herd Book, obtaining the following points in the two days' tests: cows under five years old, sixty points; cows five years old and upwards, seventy points. Two special prizes of 5*l.* each were also offered by the English Jersey Cattle Society for the milk yields of cows in these two classes which contained not less than 3 per cent. of butter fat, the prizes being awarded according to the same scale or points as for the butter tests, with the substitution of the words, "every 1 lb. of milk," for "every ounce of butter." To obtain prize or commendation for milk yield it was necessary for cows in Class 146 (exceeding 900 lb. live weight) to obtain a minimum of ninety points, and for cows in Class 147 (not exceeding 900 lb. live weight) to obtain a minimum of eighty points. The results of both butter and milk tests are tabulated on page 167.

SHEEP.

The sheep entries numbered 525, as against 571 last year. Southdowns were again the most numerous, with 97 entries, the other breeds most strongly represented being Hampshire Downs (66 entries), Shropshires (56 entries), Kent or Romney Marsh (49 entries), Lincolns (44 entries), Suffolks (39 entries), and Oxford Downs (34 entries).

Oxford Downs.—Thirty-four entries from eleven flocks were received for the four classes. The show was an average one, including some first-class typical animals. The shearling rams (Class 148) were a good, strong, representative class with two or three sheep of high-class merit. The ram lambs (Class 149) consisted of thirteen first-class pens of great merit. The shearling ewes (Class 150) contained an entry of four pens, and "all were particularly good." The ewe lambs (Class 151) were about the best class in this section. It contained nine pens "most true to type."

Shropshires.—The Judge reported that the Shropshires, numbering fifty-six entries in five classes, shown by fifteen

RESULTS OF BUTTER AND MILK TESTS AT PARK ROYAL, JUNE 20 AND 21, 1904.

CLASS 146.—COWS OF ANY AGE, BREED, OR CROSS, EXCEEDING 900 LB. LIVE WEIGHT. 11 ENTRIES.

No. in catalogue	Exhibitor	Name of Cow	Breed	Live weight	Date of birth	Date of last calf	No. of days in milk	Milk yield in 48 hours	Butter yield to lb. butter	Colour and quality of butter		Total No. of points	Awards	CHURNING					Milk Tests						
										Colour	Quality			No. of points for butter	No. of points for period of lactation	No. of points for 2nd prize, £6	Began	Finished	Duration	Dairy	Cream and churn	Buttermilk	Points	Awards	
																									Time
1207	G. Berry	Tiny's Daisy	Jersey and Sh. or Crs.	973	Jan. 1899	Dec. 5, '03	198	86	0 4 104	18.53	Fair	Good	74.25	24.00	99.25	Cert. of Merit	H. C.	9.55	11.10	75	61	52	59	110.00	H. C.
1210	Li.-Col. Eyre Coote	Red Thorn	Jersey	931	Dec. 31, '96	Oct. 25, '03	230	74	10 3 84	21.13	Very Fair	Good	56.50	24.00	80.50	Cert. of Merit	H. C.	9.40	10.35	55	61	52	55	98.92	H. C.
1212	J. Evans	Fanny	Shorthorn	1351	1898	May 7, '04	143	108	10 4 133	22.85	Good	Good	77.75	24.00	101.75	H. C.	9.56	10.41	51	61	52	56	109.42	H. C.	
1213	J. Evans	Sea Star 2nd	Linc'n Red	1638	1898	June 6, '04	14	102	6 5 5	19.27	Good	Good	85.00	2.00	87.00	H. C.	10.13	11.26	71	61	52	56	102.37	H. C.	
1214	F. Hargreaves	Merton	Guernsey	917	April, 1896	Apr. 30, '04	51	92	8 4 153	18.61	Good	Good	79.50	2.20	81.70	H. C.	10.13	11.24	73	61	52	58	94.70	H. C.	
1215	Dairymaid	Régina's Sublimity	Jersey	924	July 14, '99	Apr. 6, '04	75	87	4 3 13	22.88	Pale	Very Fair	61.00	7.00	68.00	Cert. of Merit	H. C.	10 12	10.50	38	61	52	56	94.25	H. C.
1221	D. Mutton	Lacy 5th	"	1050	Aug. 4, '93	Mar. 9, '04	103	86	14 4 133	17.87	Pale	Very Fair	77.75	12.00	90.75	Cert. of Merit	H. C.	10.42	11.20	38	62	52	56	99.97	H. C.
1225	C. A. Scott-Murray	Garantie 7th	"	924	Feb. 3, '98	Mar. 12, '04	100	83	4 5 54	15.57	Very Good	Good	85.50	12.00	97.50	3rd prize £4, & B.M.	H. C.	11 0	11.40	40	62	52	56	95.25	H. C.
1226	Dr. H. Watney	Red Maple	"	1222	July 14, '96	Apr. 28, '04	53	112	8 5 133	19.25	Very Good	Fair	95.50	2.00	97.50	Cert. of Merit	H. C.	11.15	11.55	40	62	52	54	115.10	Prize £5
1228	Dr. H. Watney	Sydney's	"	993	Jan. 1, '97	Jan. 2, '04	170	57	2 3 133	14.92	Good	Good	61.25	24.00	85.25	Cert. of Merit	H. C.	11.25	11.55	30	62	52	53	81.12	—
1229	Dr. H. Watney	Thorn 2nd	"	934	Oct. 27, '99	Feb. 6, '04	135	82	12 5 1	16.34	Very Good	Fair	81.00	19.00	100.00	1st prize, £10, & S.M.	H. C.	11 40	12 19	39	62	52	56	101.75	H. C.

CLASS 147.—COWS OF ANY AGE, BREED, OR CROSS, NOT EXCEEDING 900 LB. LIVE WEIGHT. 11 ENTRIES.

1208	G. Berry . .	Tiny's Duchess	Jersey	805	June 30, '99	Apr. 21, '04	60	79	14 3 114	21.56	Very Good	Very Good	59.25	4.00	63.25	H. C.				
1209	W. C. Cooper .	4th d'n Fern's Rose 2nd	"	777	Mar. 9, '99	Apr. 12, '04	69	74	0 3 83	20.86	Fair	Very Good	56.75	5.80	62.55	—				
1215	Bishop of Ipswich	Oxford	"	819	Mar. 28, '97	Apr. 10, '04	71	100	8 4 144	20.48	Good	Good	78.50	6.20	84.70	Cert. of Merit	H. C.			
1216	Bishop of Ipswich	Sylvia's Brown	"	875	Nov. 10, '96	Jan. 13, '04	159	83	10 4 21	20.13	Fair	Very Good	66.50	23.80	90.30	Cert. of Merit	H. C.			
1217	Mrs. McIntosh	Fairy	"	896	Mar. 5, '95	Jan. 7, '04	165	92	10 4 84	20.44	Fair	Fair	72.50	24.00	96.50	2nd prize, £6	H. C.			
1218	Mrs. McIntosh	Forget-me-not	"	770	July 30, '99	Jan. 18, '04	154	61	6 3 4	18.79	Fair	Good	52.25	22.80	75.05	Cert. of Merit	H. C.			
1219	A. Miller-Hallett	Gold Mine	"	854	1898	Apr. 25, '04	56	88	0 4 143	17.93	Good	Good	78.50	3.20	81.70	Cert. of Merit	H. C.			
1220	D. Mutton . .	Viola's	"	875	Apr. 18, '94	Jan. 12, '04	167	2	4 123	20.31	Good	Good	76.50	24.00	100.50	1st prize, £10, & G.M.	H. C.			
1221	Capt. Smith-Neill	Viola's	"	854	Aug. 12, '95	Feb. 20, '04	121	82	2 4 82	18.12	Good	Good	72.50	8.10	80.60	Cert. of Merit	H. C.			
1222	Dr. H. Watney	Brandy	"	896	1897	Apr. 27, '04	54	100	0 5 91	17.87	Very Good	Good	80.50	2.80	82.30	3rd prize, £4	H. C.			
1223	Mrs. W. Winchester	Violetta Golden Glance	"	896	Apr. 17, '98	Feb. 2, '04	139	97	8 3 83	27.61	Good	Fair	56.50	19.80	76.30	Cert. of Merit	H. C.			

* The "Butter Ratio" represents the number of lb. of milk reckoned as equal to an Imperial gallon.
 † Gold Medal, ‡ Silver Medal, § Bronze Medal of the English Jersey Cattle Society.

R. C. ASSHETON, Steward. June 21, 1904.

ERNEST MATHEWS, Judge.

exhibitors, were upon the whole quite up to the average of former years, displaying great uniformity of character, with scarcely an exhibit in the whole section that was not worthy of a commendation. The shearling rams (Class 152) numbered nineteen entries. The first prize animal (No. 1273) was a "sire of great merit, with plenty of masculine character, bone, with the right sort of flesh, good in his wool and skin, but wanted more colour." The second prize (No. 1278) was a ram of the "old Shropshire type, possessing fine constitution and flesh, good in wool and skin, wanting in finish, and none too good in his hind legs." The pens of five shearling rams of the same flock (Class 153), the prizes for which were provided by the Shropshire Sheep Breeders' Association, were described by the Judge as the "strongest and best in the section, showing great uniformity throughout." The first prize pen (No. 1296) was "well to the front, the exhibits being beautiful in colour, character, and type, good in their wool, with the right sort of flesh, and their legs well placed." The second prize was awarded to No. 1288, a "pen of nice sheep, true to type, good in their wool and backs, not particularly good in their skins, and lacking size." Class 154, for pens of ram lambs, was a particularly good one, containing many exhibits of great promise. The first prize pen (No. 1305) were "beautiful lambs, perfect in wool, skin, and character, with their legs well placed, and looked like making first-class sires." The second prize pen (No. 1301) were rams with "nice character, good wool and skins, and also likely to grow into good useful sires." The shearling ewes (Class 155) only contained six exhibits, but the prize animals were of "exceptional merit, and a better lot than the first prize pen (No. 1310) has seldom been seen. They were beautiful in character, style, wool, and flesh, with legs properly placed." The second prize pen (No. 1313) were of "great scale, long, wide, and deep, with good wool and skins, but lacked finish." The ewe lambs (Class 156) all received mention, and the leading pen (No. 1321) contained beautiful lambs with perfect fleeces and showing a lot of good breeding.

Southdowns.—This was a most meritoriously represented breed, with ninety-seven entries in five classes, from seventeen flocks. They contained a very small proportion of inferior animals, and generally were shown in very good condition, few being excessively fat. The two-shear rams (Class 157), the prizes for which were offered by the Southdown Sheep

Society, were very good. The shearling rams (Class 158) was a large class of "somewhat uneven merit, a considerable number of sheep having soft or thin wool. The ram lambs (Class 159) made a good class, but appeared somewhat uneven, by reason of difference in age. Shearling ewes (Class 160) was a good class and contained three pens of extraordinary merit. The ewe lambs (Class 161) was one of the best classes.

Hampshire Downs.—With 66 entries in five classes from seventeen flocks, the show of this breed was excellent and representative. The two-shear rams (Class 162), though not a large one, contained several good specimens. The shearling rams (Class 163) contained fourteen exhibits; but several of the most typical sheep showed evidence of having been worked freely as lambs, which had not improved their showyard prospects as sheep. The ram lambs (Class 164) were particularly good, the prize winners and others showing great merit. The first prize pen in this class (No. 1447), exhibited by Mr. T. Fowell Buxton, gained the Champion Prize offered by the Hampshire Down Sheep Breeders' Association. The Reserve Championship was also found in this class, being awarded to Mr. James Flower for the second prize pen (No. 1451). The shearling ewes (Class 165) were satisfactory. Class 166 contained a large exhibit of fifteen pens of ewe lambs, many of them being excellent.

Suffolks.—The entries numbered thirty-nine in six classes from seven different flocks. The two-shear and shearling rams (Classes 167 and 168) contained some excellent specimens of the breed. Some of the shearling ewes (Class 171) were shown rather too fat. The lambs, both rams and ewes (Classes 169, 170, and 172), were the largest classes, containing excellent specimens of good type and colour.

Lincolns.—The seven classes attracted forty-four entries from nine flocks. The Judge considered the collection to be one of the best seen at the "Royal" for some years. The prizes were well contested in all the classes, except Class 173. This only contained one two-shear ram, exhibited by Mr. Henry Dudding; but it carried off the Champion Prize offered by the Lincoln Long Wool Sheep Breeders' Association.

Leicesters.—Although few in numbers, viz., twenty entries in four classes from four flocks, the Leicester sheep were very good in quality. The first prize shearling ram (Class 180) is "firm on his back, and carries a beautiful fleece." The

second is "well proportioned, but not so good in wool as the first prize sheep." The shearling ewes (Class 182) formed a very good class, the first and second prize pens being of very nearly equal merit.

Cotswolds.—Although four classes were provided, with prizes amounting to 72*l.*, no entries were received for three of the classes, and Class 184, for shearling rams, had to be cancelled owing to insufficient entries.

Border Leicesters.—All four classes offered for this breed had to be cancelled owing to insufficient entries.

Kent or Romney Marsh.—With five classes, the entries numbered forty-nine from ten flocks. The first prize two-shear ram in Class 192 (No. 1592) was described as a small but beautiful specimen of the breed. The class as a whole was good. The shearling rams (Class 193) were also good, showing more uniformity of type. The pens of shearling ewes (Class 195) were the best of the section.

Wensleydales.—There were eighteen entries of this breed in four classes from four flocks. The competition amongst the shearling rams (Class 197), which numbered seven entries, was a close one. The shearling ewes (Class 199) were also very good with five entries. The lambs (Classes 198 and 200) were fairly good, but owing to the coldness of climate where these sheep are bred, lambing does not commence until March.

Dorset Horns.—Twenty-five entries appeared in the four classes from seven flocks. The competition was good in all classes with the exception of the shearling rams. The first prize shearling ram (Class 201) was a "fairly good specimen with good wool, but lacking behind the shoulders." The first prize pen of ram lambs (Class 202) "showed a lot of quality, with good heads." In the pens of shearling ewes (Class 203) Mr. E. A. Hambro secured the first and second prizes, and his first prize pen was also awarded the Champion Prize of 10*l.* given by the Dorset Horn Sheep Breeders' Association for the best pen of ram lambs, shearling ewes, or ewe lambs, exhibited in Classes 202 to 204. They are described as "splendid specimens of the breed, having good flesh, wool, and heads." In the class for ewe lambs (204) the competition was very close, both prize pens showing good breeding. The pen placed first were good in their wool, with good faces and length. The second prize pen were of nice quality on short legs, but did not show the length of the first prize pen, to which was also given the Reserve Number for the Championship.

Devon Long-wool.—Two classes were provided for this breed, and seven entries were received from four flocks. Though few in number, the exhibits were good, and all received mention by the Judge.

Dartmoor.—Three entries from three flocks were made in each of the two classes. The animals showed the characteristics of the breed, the shearling ewes being exceptionally good.

Exmoor.—There were six entries in the two classes from three exhibitors. The first prize animals were excellent.

Cheviots.—The entries numbered nine in the two classes, all being exhibited by the Messrs. Robson. The first prize ram (Class 211) was "full of style, and with excellent wool." The first and second prize pens of shearling ewes (Class 212) were both good, the first being "superior with wool and hair, and containing one particularly good gimmer; the second were a well-matched pair."

Black-faced Mountain.—This section had nine entries in the two classes from four flocks. They were very good animals, and presented a most creditable appearance. Amongst both the rams and ewes there were animals of conspicuous merit.

Lonks.—These were represented by eleven entries from seven flocks, and were as good as could possibly be bred.

Herdwicks.—The two classes contained six entries from three flocks. Both rams and ewes showed superior breeding.

Welsh Mountain.—The two classes contained eleven entries from four flocks. The rams exhibited (Class 219) were all true to type. Shearling ewes (Class 220) were described by the Judge as "the most perfect lot of pure Welsh Mountain ewes he had ever seen. They were of proper size, and the wool was so close as to be weather-proof in any climate where herbage for stock would grow."

Ryeland.—This breed had three classes with twelve entries from three flocks. The quality throughout was good. The first prize in Class 221 was "a very compact two-shear ram, on short legs, with nice wool." In Class 223 the first prize was given to "a pen of beautiful ewes, which won easily."

Pigs.

These constituted an excellent exhibition of 227, as against 222 last year. The breeds were divided into Large White and Middle White (Small White Pigs being eliminated), Berkshire, Tamworth, and Large Black Pigs, each breed having four

classes and a Gold Medal, offered respectively by the National Pig Breeders' Association, the British Berkshire Society, and the Large Black Pig Society.

White Pigs.—These numbered seventy-four, and included forty-eight of the Large White and twenty-six of the Middle White variety. The Earl of Ellesmere took the Champion Prize in Class 224 for No. 1760, a "particularly level, good boar, with a fine underline, standing well on his legs, which, if anything, were a little short." In Class 225 (Large White boars, farrowed in 1904) the first prize was awarded to No. 1766, "a pen of exceedingly well-grown pigs, but somewhat uneven." This class, which numbered fourteen exhibits, was a very good one, of uniform quality and of general excellence. The breeding sows class (No. 226) contained ten entries, all present, and were so good that every animal exhibited, except one, obtained a card. The first prize and Reserve Champion (No. 1785) was taken by Lord Ellesmere, with an "enormous sow of splendid quality, and with the exception of her head and ears—the former being a trifle long, and the latter too drooping—was a grand type of the true Large White." The first prize pen of sow pigs (Class 227) were a "beautiful well-grown, even lot, and had an easy win." After the first prize was awarded, eight pens were so even in quality that the Judge had great difficulty in placing them. The class numbered fifteen entries, all being present but one. The Judge (Mr. John Barron) remarked, in conclusion, that he was much struck with the great improvement in type, and general excellence of all the animals placed before him since the last time he had judged for the Society. The Judge of Middle Whites considered that these classes "on the whole were not of average merit." Mr. Sanders Spencer took the first prize and Reserve Championship with his boar (No. 1809), which was described as a "useful specimen, weak in its forelegs." The first prize exhibits in Class 229 were a pen of three "level, useful-looking boars"; "several of the exhibits in this class were more of the Large than Middle breed." The breeding sows (Class 230) were the best of the section, and the first prize animal (No. 1821), exhibited by Mr. Sanders Spencer, gained the Champion Gold Medal. This animal was "very level, with a typical Middle bred head, and straight, well set on legs." In Class 231, the first and second prize pigs "were of considerable merit, the remainder of the class being very

uneven, several looking as if they might have been in the Large White breed class."

Berkshires.—This breed numbered seventy-three entries, as against sixty-two last year. The Hon. Claud B. Portman gained the Champion Prize for the first prize sow in Class 234 (No. 1889). "This sow was undoubtedly one of the best shown for some years, and easily secured the Championship." The Reserve Championship was won by Sir Alexander Henderson, with his first prize boar in Class 232 (No. 1841). The breeding sows (Class 234) were the best of the section, and contained many splendid pigs. With the exception of four out of the twenty exhibits, all were mentioned, and the Judge (Mr. Edney Hayter) states that he never judged a better class.

Tamworths.—The total of twenty-seven entries was the same as last year. The Champion Prize was gained by Mr. H. C. Stephens for the first prize breeding sow (No. 1922) in Class 238; Mr. Robert Ibbotson winning the Reserve Championship with the first prize boar (No. 1907) in Class 236. With the exception of the first prize winner, which represented the breed fairly well, the other prize winners in Class 236 were not of any noticeable merit. The boars in Class 237 contained some very promising specimens of the Tamworth type, the prize pens running each other very closely. Class 238 contained some very excellent breeding sows, well forward in their breeding state, and not overlaid with useless fat. The prize animals followed each other very closely, and were all worthy of special mention. The sow pigs (Class 239) had seven entries, and the first prize was awarded to pen No. 1931, containing three nicely matched hilt.

Large Black.—This section contained the large number of fifty-three entries as against forty last year, and the quality was also exceedingly good. The Judge (Mr. George Pedley) reported as follows :—

There are evidences that the Large Black Pig is approximating year by year into a typical pig, viz., massive in body, good fleshed, and fine in skin and bone; or, in other words, the greatest weight of meat and the minimum weight of waste. The exhibits this year display these characteristics in a marked degree. The various classes were strongly represented, and the quality was so uniformly good that much difficulty presented itself in selecting the prize winners, particularly in the class for breeding sows (Class 242). In my opinion a finer lot of thoroughly typical pigs were never got together; certainly not at the Shows of the Royal Agricultural Society.

The Championship in the class for boars was gained by Mr. John Robinson for No. 1939 (Class 240), an "exceptionally

level, good-fleshed pig, and the right sort to maintain the high standard of breed and quality so manifest in the breeding sows." The Reserve Championship was taken by the second prize boar in the same class, No. 1938, exhibited by Mr. C. F. Marriner. The Judge adds that in his opinion, "many of the exhibits, particularly in Classes 240 and 242, were much too fat. In some cases the estimate of their usefulness for breeding purposes could not even be approximated, and by excess of fat some points were unduly magnified and the defects obscured."

POULTRY, INCLUDING DUCKS, GEESE, AND TURKEYS.

This year's poultry section contained several new features. To the prize sheet were added classes for breeding pens of fowls and ducks consisting of one cock or cockerel and four hens or pullets, or one drake and four ducks. Two classes for new laid hens' eggs shown in cases, each containing "one great hundred" (120) and divided into classes for white shells and brown or tinted shells, were also novel. Sussex and Ancona classes were added to the classes for fowls, but the latter variety was unrepresented by entries. Indian Runners were added to the ducks. Facilities were provided for the sale of the birds in the poultry department at the Show, and exhibitors were invited to state the prices at which they were prepared to sell their exhibits for inclusion in the catalogue. The prices so stated ranged from 100*l.* downwards, but the actual sales only amounted to 17*l.* 6*s.* 7*d.*

The Table on page 175 shows the distribution of the prizes, classes, and entries, for all descriptions of poultry at the Show of 1904, the corresponding figures for 1903 being added for comparison.

Fowls.—The *Old English Game* exhibits were good on the whole; the prize birds, especially cocks and cockerels, merited exceptional praise. *Indian Game* prize winners were of good type and quality. *Dorkings* were a really first-class collection. The Judge expresses great disappointment with the entries of *Sussex* fowls both as to numbers and quality. The *Sussex* Poultry Club contributed 7*l.* towards the prizes for these classes and also offered three Silver Medals for the best bird of the red or brown, light, and speckled varieties. The Medals were gained by Mr. D. Roberts, Messrs. E. and H. Russell, and Mr. C. Page.

The *Brahma* first prize hen was large and very good in colour, shape, and feather. The *Cochin* cocks were all of

Prizes, Classes, and Entries of Poultry, 1903 and 1904.

Description	Prizes		Classes		Entries	
	1903	1904	1903	1904	1903	1904
<i>Fowls—</i>	£ s.	£ s.	No.	No.	No.	No.
Game	22 0	14 0	8	8	105	41
Dorking	27 10	17 10	10	10	90	69
Sussex (including Medals)	—	24 0	—	12	—	48
Brahma and Cochin	16 10	10 10	6	6	53	19
Langshan	11 0	3 10	4	2	15	4
Plymouth Rock	11 0	7 0	4	4	53	33
Wyandotte	27 10	17 10	10	10	87	64
Orpington	22 0	14 0	8	8	121	113
French	5 10	10 10	2	6	13	4
Minorca	11 0	7 0	4	4	32	18
Leghorn	16 10	10 10	6	6	33	14
Ancona	—	3 10	—	2	—	—
Andalusian	5 10	3 10	2	2	15	3
Hamburgh	11 0	—	4	—	14	—
Any other breed	5 10	7 0	2	4	16	6
Table fowls	11 0	7 0	4	4	27	33
<i>Ducks—</i>						
Aylesbury	11 0	7 0	4	4	19	14
Rouen	5 10	3 10	2	2	14	12
Pekin	5 10	3 10	2	2	10	—
Cayuga	—	3 10	—	2	—	10
Indian Runner	—	3 10	—	2	—	12
Any breed	2 15	1 15	1	1	8	3
<i>Geese</i>	14 0	12 0	4	4	16	16
<i>Turkeys</i>	7 0	6 0	2	2	22	17
<i>Eggs</i>	—	3 10	—	2	—	20
<i>Breeding Pens</i>	—	24 0	—	8	—	30
TOTALS	£249 5	£225 5	89	117	763	603

partridge colour, the first prize bird being by far the best in shape and feather. The pullets were not a good class. The *Langshan* cocks only numbered four, but all were excellent specimens. In the *Plymouth Rock* classes, the first prize cock was a well-barred bird, with good legs, shape, and comb. The first prize hen had also good legs and colour, and was shown in fine form. The *Wyandottes* comprised some excellent prize birds. The *Orpington* classes were fairly well filled, and the quality of the exhibits was excellent. Of the six classes provided for French breeds, only one contained any entries. This consisted of *Faverolle* hens, three of them very good specimens. The *Minorca* cocks were disappointing in numbers, but the quality was all that could be desired. The

first and second prize hens were excellent specimens. The *Leghorns* were poorly represented. With two or three exceptions the birds were but moderate. *Andalusians* had only three entries, of which two received prizes. The two classes for "Any other breeds" contained only three entries in each, the varieties represented being Silver Spangled, Black Hamburgh, and Malay; all received prizes. *Table Fowls* consisted of four classes for pure and cross-bred living birds. For the early season the birds were forward and good. The classes were interesting and instructive. Of the pure breeds, five out of the six prizes were awarded for dark Dorkings, which were wonderfully developed chickens. The other prize went to an Indian Game. In the cross-bred classes, the cross between the Indian Game and the Orpington produces a very compact and fleshy fowl, which comes quickly to maturity. This cross secured the first prize in both the cockerel and pullet classes.

Ducks.—*Aylesburys* were badly represented; the *Rouen* classes were better. The ducklings of both varieties were creditably brought out in respect of size and condition. The *Cayuga* and *Indian Runner* classes were fairly numerous, and for the time of year meritorious. The winning Indian Runner drake was perfect in type, though the colour was not so good.

Geese.—These were weak in numbers, but the specimens sent were very creditable.

Turkeys.—These made a good display and some magnificent specimens were penned.

Eggs.—The exhibits were generally of very good quality, with the desirable characteristics of freshness and cleanliness, and with uniformity of size and colour strongly marked. The Judge highly praises all the eggs and the manner in which they were packed.

Breeding Pens.—These consisted of one male and four female birds in six classes for Indian Game, Dorking, Plymouth Rock or Wyandotte, Orpington, Minorca or Leghorn, and any other variety. The ducks were for white and coloured birds of any variety. The classes were very interesting, and would have been more instructive had the entries been more numerous.

FARM AND DAIRY PRODUCE.

The following Table gives particulars of the prizes, classes, and entries for each description of produce with the corresponding figures for 1903 :—

*Prizes, Classes, and Entries of Farm and Dairy Produce,
1903 and 1904.*

Produce	Prizes		Classes		Entries	
	1903	1904	1903	1904	1903	1904
	£	£	No.	No.	No.	No.
Butter	71	41	5	4	154	92
Cheese	90	78	8	16	90	58
Cider and Perry	40	40	4	4	79	65
Corn	42	42	7	7	19	23
Wool	48	48	8	8	37	51
Hops	48	48	6	6	15	11
Hives and Honey	70	53	50	37	203	244
Total	£409	£350	88	82	597	544

Butter.—The entries totalled ninety-two in the four classes. Mr. Thomas Latham acted as Judge, and reported that Class 361 (ten entries), for butter delivered on or before May 7, included some very useful exhibits. Class 362 (fourteen entries), for 2 lb. rolls of butter, included some very good and some very inferior exhibits. Class 363 (forty-one entries), for fresh butter slightly salted, was a very good one on the whole, but scarcely so good as might be expected. Class 364 (twenty-seven entries), for butter made from milk drawn from cows outside the Channel Islands breeds, was not a good one, and if the butter that took the prizes in the preceding class had been eliminated the class would have been a very poor one.

Cheese.—In addition to the usual classes for Cheddar, Cheshire, Stilton, Wensleydale, Double Gloucester, and Wiltshire cheeses, classes were added this year for Cheddar, Truckle, Leicester, Caerphilly, and cream cheeses. Prizes for Brie, Camembert, Coulommier, Pont l'Évêque, Gervais, and Port du Salut cheese of English make were also offered, and it is somewhat surprising that, considering the attention now given in this country to the making of French cheeses, no entries for them should have been forthcoming. The Cheddar cheese (Class 365) was on the whole very good. Cheshire cheeses (Class 366) were well above the average in quality. Stilton cheese (Class 367) was excellent in quality. Wensleydale cheese (Class 368) was very poorly represented, and the only cheese worthy of notice was that which gained the first prize. The Judge remarks that Double Gloucester cheese (Class 369) seems to be losing the

favour of the cheese-eating public, and he attributes this to the indifferent manner in which it is made so far as quality is concerned. Wiltshire Loaf cheese (Class 370) was poorly represented both in numbers and quality. The Cheddar Loaf (Class 371) was on the whole very good indeed. The Caerphilly cheese (Class 373) was poor in quality.

Cider and Perry.—The entries in the four classes numbered sixty-five, as against seventy-nine last year. The Judge (Mr. T. B. Richards) reported as follows:—

CLASS 381 (Cider in Cask, made in 1903).—As a class this was a fairly good one. The first prize was a rich and good sample, being clear and bright, with a good fruity flavour. The second and third were of the same type of cider, with a little less life and body. Several in this class tasted slightly of the cask, and one or two were inclined to be sharp.

CLASS 382 (Cider in Bottle, made in 1903).—This was the strongest class. The first prize I consider the best cider in the Show for flavour and aroma, and full of life, keeping its colour well after staying some time in the glass. The second and third prizes were evidently made in the same district, and both were very good. Several of the others were well worthy of commendations. At the same time a good many in this class had gone sharp; others clearly showed the want of sun to ripen the apples during the last season, being thin and unsatisfactory.

CLASS 383 (Cider in Bottle, made in any year before 1903).—This was not at all a good class; the first, second, and third were decidedly before the rest.

CLASS 384 (Perry).—A small class. I considered No. 2797 the best flavoured, but it was full of sediment, so I placed No. 2798 in front of it.

Chemical analyses were made of the samples by Dr. Voelcker, and the results of the analyses of those samples which received an award are given below:—

CLASS 381.

No.	Specific gravity	Total solids	Alcohol	Sugars as glucose	Acidity	Award
		per cent.	per cent.	per cent.	per cent.	
2741	1·0314	8·74	2·51	6·25	·241	1st Prize
2749	1·0310	8·90	3·42	5·90	·328	2nd Prize
2742	1·0287	8·04	2·86	5·95	·241	3rd Prize
2740	1·0237	7·25	4·13	5·20	·318	R. N. & H. C.
2738	1·0225	7·22	4·98	4·90	·469	H. C.

CLASS 382.

2759	1·0296	8·31	3·18	6·10	·254	1st Prize
2758	1·0293	8·05	3·07	5·80	·221	2nd Prize
2760	1·0340	9·22	2·65	6·25	·231	3rd Prize
2773	1·0329	9·33	3·69	6·10	·392	R. N. & H. C.
2772	1·0327	9·30	3·83	6·20	·425	H. C.
2757	1·0326	9·12	2·79	6·80	·243	Com.

CLASS 383.

No.	Specific gravity	Total solids	Alcohol	Sugars as glucocse	Acidity	Award
		per cent.	per cent.	per cent.	per cent.	
2783	1·0251	7·58	3·97	4·46	·371	1st Prize
2794	1·0221	6·71	4·27	4·46	·317	2nd Prize
2782	1·0271	8·21	4·20	5·20	·322	3rd Prize
2793	1·0411	11·02	2·52	7·80	·348	Com.

CLASS 384.

2798	1·0442	11·97	2·51	6·65	·375	1st Prize
2797	1·0366	10·07	3·21	6·00	·512	2nd Prize
2799	1·0395	11·41	4·25	6·95	·385	3rd Prize
2800	1·0206	6·79	5·39	2·76	·690	R. N. & H. C.

Corn.—The entries numbered twenty-three, as against nineteen last year, and were restricted to wheat, barley, and oats, no entries being received for the bean and pea classes. Mr. R. Hewlins acted as Judge, and reported that although the samples shown were few in number, doubtless owing to the time of year, the quality of the exhibits was very good, more especially the wheat and oats. The samples of rough chaff wheat were very fine, and some of them unusually strong. The oats were some of the best that the Judge had seen that year, and all were well over the average.

Wool.—The eight classes had fifty-one entries, Classes 394 and 397, for different varieties of long and short wool, being the best filled. The Judge reports that the exhibits sent were satisfactory. He states that in some cases the fleeces were wrapped up with reaper twine, which was most unsatisfactory, “as it often unravels and gets into the wool, leading to dangerous results in cloth.”

Hops.—Eleven entries were made in three classes. Three other classes, for Weald of Kent, Hants or Surrey, and Sussex hops, were unrepresented by entries. The Judge reports that the samples sent were good in quality and well managed.

Hives, Honey, and Bee Appliances.—This department was organised as usual by the British Bee-keepers' Association, the prize money amounting to 53*l.*, in thirty-seven classes. The Judges of hives and appliances in their report mention specially a very interesting and instructive exhibit in Class 411, viz., a “Swarthmore” outfit for raising queens, shown in active operation by Messrs. James Lee & Sons. Live cells

were being worked out and larvæ fed, and the whole process was practically demonstrated from the commencement, ending with two little nuclei containing fertilised queens. Mr. W. P. Meadows showed a somewhat similar appliance. There was a very large show of bees-wax of generally good quality, but the mead and honey vinegar were deficient in flavour and aroma. The honey classes brought together a good display of more than average quality, including good produce of the current year from the Midland counties, especially Lincolnshire.

BUTTER-MAKING COMPETITIONS.

Fifty-eight candidates appeared to compete for prizes of the total value of 36*l.*, offered for Butter-making Competitions held in the Dairy during the Show. The Judge (Mr. P. Hedworth Foulkes) reported that in Class I., for "dairymaids and members of a farmer's family" (seventeen competitors), the work on the whole was very well done, though one or two of the competitors were considerably behind the majority of the class. In Class II., for "persons actually under instruction or who have been so during 1903 or 1904 at a recognised Dairy School," there were fourteen competitors. Class III., open to all comers (twenty-seven competitors), was divided into two portions. The competition was very close, and some excellent work was done. The prize winners of the first three classes competed as Class IV. for a prize of 5*l.* and the Society's Silver Medal. There were nine candidates, and the competition was held on the last day of the Show. All the competitors showed considerable skill in working, and the appearance of the produce when staged deserved high commendation. The prize and Silver Medal were gained by Miss E. M. Dawson, of Park Farm, Osmaston, Derbyshire.

HORSE-SHOEING COMPETITIONS.

The usual prizes, amounting to 32*l.*, were offered in two classes, for hunters and cart horses, and the entries numbered ninety-six. The Judges (Mr. Henry G. Lepper and Mr. John Malcolm) expressed great satisfaction with the work generally. They state that on the whole the feet were well prepared, the shoes skilfully "turned" and well set on. In the hunter class (forty-five competitors) some of the work had been done as well in previous years, but never had it been so uniformly good. In the shoeing of the cart horses (fifty-one competitors) most of the work was executed exceptionally well. Many

young men competed, and were able to hold their own with older competitors. The first prize winner in each class received the Freedom of the Worshipful Company of Farriers, and fourteen of the candidates passed an examination held in the Showyard for admission to the Register of Shoeing Smiths (R.S.S.). A well-attended lecture on "The Horse's Foot and How to Shoe It," was given by Professor Macqueen at the Shoeing Forge, on Thursday, June 23.

BRITISH FORESTRY EXHIBITION.

It was originally intended that Forestry should form part of the Agricultural Education Exhibition¹ held in 1903, but it was soon realised that so important a section must have separate organisation, and the idea was abandoned for that year. On July 29, 1903, the Education Committee, having regard to the revival of interest in forestry, recommended that a Forestry Exhibition be organised by the Society at the Show of 1904, and this proposal being adopted by the Council, a small Committee was appointed under the Chairmanship of the Marquis of Granby (who subsequently acted as Steward) to prepare a scheme and carry it into effect. The Committee was strengthened by the addition of expert members, viz., Mr. George Marshall (President of the English Arboricultural Society), Dr. William Somerville (of the Board of Agriculture), and Mr. Daniel Watney (of the Surveyors' Institution).

With the cordial co-operation as exhibitors of His Majesty's Commissioners of Woods and Forests, of some of the largest forest owners and their foresters, and of the Agricultural Colleges at Cirencester, Aberystwyth, and Wye, an excellent collection representing all departments of forestry was got together, and proved highly interesting and instructive both to forestry experts and the general public. The Exhibition, which was located in the large building near the eastern entrances, was divided into seven sections.

In Section I. (cones of forest trees), Messrs Veitch & Sons exhibited a collection of cones representing about 200 species of coniferous trees, most of them cultivated in Great Britain.

The exhibits in Section II. (seedling trees and transplants) were shown in the open ground space next to the building. They went rather outside the scope intended by the Committee,

¹ The Agricultural Education Exhibition of 1904 is the subject of a Report by Mr. J. Bowen-Jones, who acted as Steward. See pp. 212-221 of this Volume.

as some of them, though attractive enough in themselves, were not true forest specimens. Other exhibits in this section had, however, real educational and scientific value. This was notably the case with a splendid collection of conifer seedlings shown by the Hon. Mark Rolle. It consisted of over a hundred and fifty seedlings and transplanted fir trees raised almost entirely from seed grown on the exhibitor's estate, the genera represented including *Pinus*, *Abies*, *Picea*, *Larix*, *Cedrus*, *Cupressus*, *Retinospora*, *Taxodium*, *Thuja*, and *Wellingtonia*. Mr. Rolle has presented this collection to the English Arboricultural Society, in order that it may continue to afford useful guidance to those interested in cone bearing trees.

Section III. consisted mainly of photographs and diagrams illustrating systems of treatment. It included also photographs of some magnificent oaks grown in Rockingham Forest and at Welbeck, with particulars of the high prices realised for the "brown" timber, this variety of the oak being highly prized.

Section IV. (timbers) was the largest of the Exhibition. The Commissioners of Woods and Forests sent a valuable collection illustrating injuries caused by the weather, by dead branches, insects, disease, &c.; the University College of Wales showed mounted specimens of timber from various species of trees grown in the neighbourhood of Dolgelly; and instructive exhibits illustrating the capabilities of home-grown timber in the form of planks and hand specimens, methods of pruning, &c., were sent by the Duke of Rutland, the Marquis of Bath, Earl Egerton of Tatton, the Earl of Yarborough, and Mr. H. J. Elwes, F.R.S.

Section V. (insects and diseases) included specimens of forest insects and fungi and their ravages, and examples of the attacks of game, birds, squirrels, voles, &c. To this section the South Eastern Agricultural College at Wye contributed an excellent exhibit including living specimens, and mention should also be made of a very complete series of mounted specimens of forest insects collected during many years by Mr. A. T. Gillanders, forester to the Duke of Northumberland.

Section VI. (forest exploitation, timber manipulation, &c.) was chiefly interesting to land owners and estate agents. The Duke of Buccleuch showed a series of "stobs" which had been in the ground from eight to fourteen and a half years, illustrating the good effects of the naphthaline process of timber preservation in use at Drumlanrig. The Earl of Yarborough sent a large number of larch and spruce posts and rails showing varieties

of fencing and the difference in lasting properties of creosoted and uncreosoted specimens, the latter being nearly rotten, whereas the former are practically as good as when set nine years ago.

Section VII. (tools and appliances) was well represented, and included collections of forestry tools used in Germany.

Practical Forestry Demonstrations were given daily in a specially prepared plot of ground at the Exhibition, and were largely attended by foresters. Professor W. R. Fisher, of Cooper's Hill, showed how plants should be lined out in forest nurseries for the production of good root systems, and Mr. Fraser Story, lecturer on forestry at the University College of North Wales, gave practical demonstrations in sowing and planting and in the use of German forest tools.

Mr. George Marshall, as Assistant Steward of the Exhibition, rendered valuable aid by personally superintending the staging of the exhibits and by explaining their significance to the numerous visitors who attended during the week.

ERNEST H. GODFREY.

13 Hanover Square, W.

MISCELLANEOUS IMPLEMENTS EXHIBITED AT PARK ROYAL, 1904.

THE number of exhibits in the Implement Department this year totalled 4,419 as against 5,524 in 1903; those entered for the Society's Silver Medals numbered 66 compared with 95 in the previous year. But what the "New Implements" lost in numbers this year they certainly gained in general interest and prospect of utility.

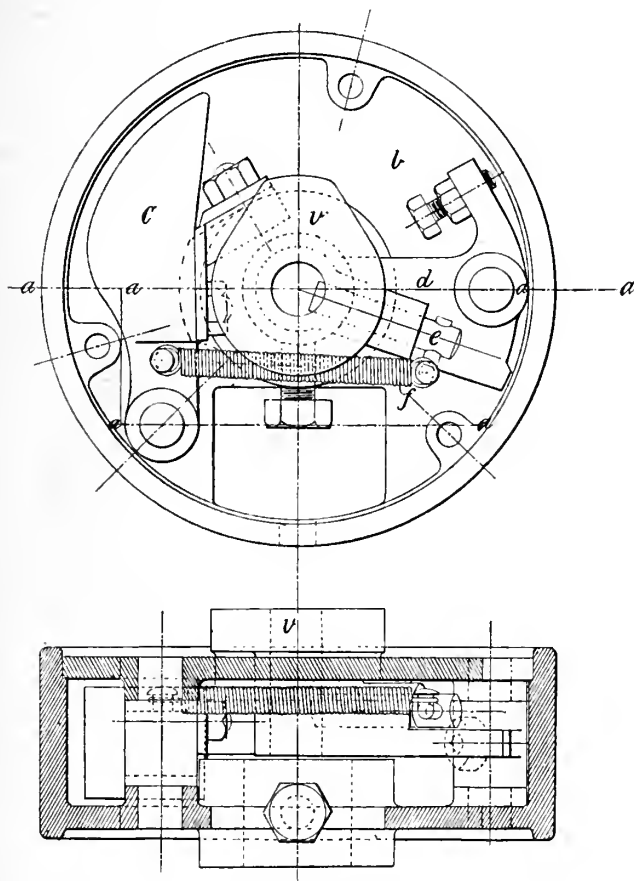
The signs of the times are probably most clearly to be read in the large numbers exhibited of small high-speed internal combustion engines, generally burning petroleum spirit. The low cost of these, coupled with their great portability and facility of starting, appears to be bringing them into favour for agricultural purposes, in spite of the somewhat dangerous nature of the fuel.

AWARDS OF SILVER MEDALS.

Seven Awards of the Society's Silver Medals for "New Implements" were recommended by the Judges (Mr. Francis E. Walker and myself) to the following Implements and Appliances:—

No. in Catalogue	Exhibitor	Nature of Award
100	BLACKSTONE & Co., LTD., Rutland Works, Stamford.	Direct-acting Centrifugal Governor for Oil Engine.
275	H. R. MARSDEN, Soho Foundry, Leeds.	Elevator.
338	IVEL AGRICULTURAL MOTORS, LTD., 45, Great Marlborough Street, London, W.	Agricultural Motor.
496	H. J. WEST & Co., LTD., 118, Southwark Bridge Road, S.E.	Refrigerating Machine.
762	RANSOMES, SIMS & JEFFERIES, LTD., The Orwell Works, Ipswich.	Motor Lawn Mower.
3092	AKTIEBOLAGET PUMP SEPARATOR, Kt. S. Kyrkogata 13A, Stockholm.	Hand Cream Separator.
4351	JAMES R. HATMAKER, 28, Boulevard Malesherbes, Paris.	Milk Drying Machine.

Article 100.—*Messrs. Blackstone & Co., Ltd., Stamford.*
 “Oil Engine, fitted with new patent direct-acting centrifugal governor.” Price 162*l.* 10*s.*—The governor of this engine was shown last year and briefly noticed in the *Journal*, Vol. 64,



Section on line *a-a*.

FIG. 1.—Direct-acting Centrifugal Governor (Article 100).

page 228. Permission having been granted for this contrivance to be entered as a “New Implement” this year, the Judges considered it worthy of the award of a Silver Medal.

Its construction is well shown in the illustrations now given (Figs. 1 and 2). On the layshaft of the engine (Fig. 1) is keyed a drum or casing (*b*), inside and near the periphery of which

is pivoted a weighted lever (*c*) carrying a ledger plate which bears against a ledger rigidly connected with the cam (*v*). This cam is carried on a lever (*d*) similarly pivoted inside the drum but projects outside of the casing. The lever (*d*) carries a rod (*e*), one extremity of which projects into a central hole formed in the cam. The other end has attached to it a spiral spring (*f*), one end of which is fixed to the weighted lever (*c*).

When the engine is running at normal speed the spring (*f*) holds the weighted lever (*c*) so that its ledger engages the cam ledger, the cam (*v*) being thus held rigid and operating the vapour valve lever on coming in contact with it.

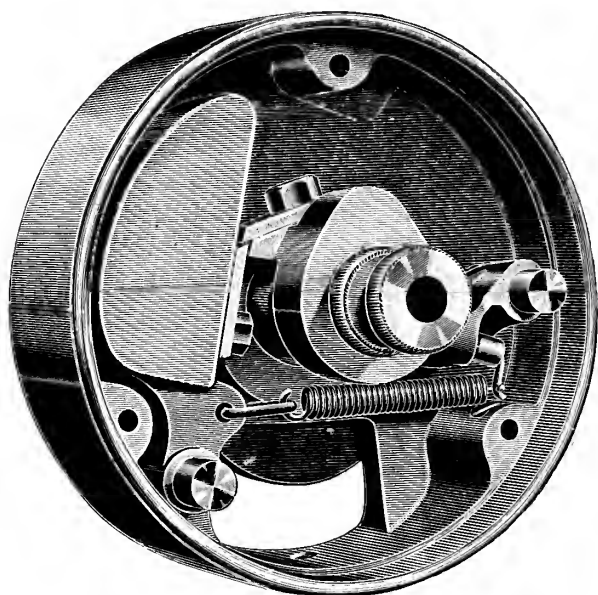


FIG. 2.—Direct-acting Centrifugal Governor (Article 100).

When the speed is exceeded the weighted lever (*c*) moves outwards under the influence of centrifugal force; the cam lever (*d*) is thus deprived of its support and is only held in position by the spring (*f*) which yields when the cam strikes the vapour valve lever so that the latter is not actuated. The speed of the engine is adjusted, whilst running, by means of a taper pin which is introduced into the central hole of the cam (*v*), and pushes out the sliding rod (*e*), thus regulating the tension of the spring (*f*).

Article 275.—*Mr. H. R. Marsden, Soho Foundry, Leeds.* “Patent Elevator, attached to Stone Breaker.” Price 4*l.* per foot of lift.—This Elevator when shown last year was not entered as a “New Implement,” and permission was granted for it to be so entered this year. It was shortly described, without illustration, in last year’s Journal (page 238), but the illustration (Fig. 3), together with the following description will make its action clearer. The chain of buckets (*d*) rotates round a lower receiving drum (*f*) and an upper delivery drum (*h*).

The material to be elevated is passed into the receiving drum, the periphery of which contains four equidistant holes (*m*), each slightly smaller than the mouth of a bucket, and the pitch of which is equal to the distance between the buckets. Each hole in turn is therefore covered by a bucket during the travel of the buckets round the periphery of the drum. It is thus evident that as the individual bucket reaches its lowest point the contents of the rotating drum (*f*) are discharged therein without permitting the least escape or overflow. On passing round the higher drum (*h*) the action is reversed, the discharge taking place from the bucket through corresponding holes on to an inclined shoot (*n*).

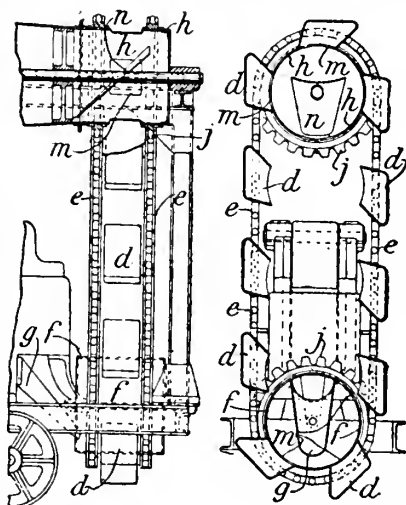


FIG. 3.—Elevator attached to Stone Breaker
(Article 275).

The elevator was exhibited attached to, and in combination with, a screening apparatus and stonebreaker, and the higher drum (*h*) formed one end of the screen into which the shoot (*n*) led the broken stone to be automatically divided into sizes. Simple provision is made for adjusting by means of sliding brackets attached to the centre shaft of the bottom drum.

Article 338.—*The Ivel Agricultural Motors, Ltd., 45, Great Marlborough Street, London, W.* “‘Ivel’ Agricultural Motor, fitted with 20 H.P. Engine, and two speeds, forward and reverse.”—This machine was very fully described and illustrated

in last year's Journal, Vol. 64, pp. 229-231. It has now been so far perfected, and has during the last twelve months so proved its utility in agriculture, that the Judges awarded it a Silver Medal.

The general design and appearance remain the same, but among the principal improvements are :—two speeds, arrangements for cooling the circulating water, automatic lubrication, and general improvement in engine detail. A simple arrangement for, and its capability of, drawing two reapers and binders at the same time was demonstrated in the Showyard.

Article 496.—*Messrs. H. J. West & Co., Ltd.*, 118, Southwark Bridge Road, London, S.E. "Patent safety carbonic anhydride process Refrigerating Machine, with combined accumulative pure ice-making tank and cold storage chamber." Price 150*l.*—This, undoubtedly one of the most attractive

exhibits in the Showyard, is of particular interest to owners of large country houses where ice is not easily procurable ; also to hotels, hospitals, and other institutions, and to butchers, fishmongers, dairymen and others, by all of whom the great advantages of cold storage must have been long appreciated (Fig. 4).



FIG. 4.—Refrigerating Machine
(Article 496).

A cold storage and ice-making plant for domestic purposes must be adapted for management by unskilled persons, and it is in the details which make the machine so simple and proof against carelessness that *Messrs. West & Co.* seem to have been especially successful. Foremost among these details is their safety valve arrangement, which is absolutely positive. Its object is to prevent the breakage of the crank shaft, piston rod, or cylinder, as the result of the attendant forgetting to open the stop valve when starting the compression. Such an accident in the case of an ammonia machine would be fraught with great danger to human life ; and though there is little danger in the case of a carbonic acid (CO_2) machine, this new and simple safety valve is a great improvement. The principle is a screw-down valve having two seats facing one another, one in communication with the air, the other with the

coils; the valve cannot be against both seats at the same time. The supply of oil to the gland through which the piston rod works is provided for by the very simple expedient of an ordinary displacement lubricator instead of the usual pump.

Attention must also be drawn to the valves which are interchangeable and of such construction that on unscrewing a nut the other parts come away by screwing one part into another; the spindle, for instance, forming a handle for drawing out or grinding in the valve. Thus a single spanner is the only tool required. Great compactness is obtained by using the hollow cast-iron base to contain the condenser coils. This is the best small cold storage and ice-making plant which has yet come under the writer's notice.

Article 762.—*Messrs. Ransomes, Sims & Jefferies, Ltd.*, The Orwell Works, Ipswich. "Patent 42-in. Motor Lawn Mower, for use on large estates." Price 150*l.* Fitted with reversing gear, 10*l.* extra.—The catalogue statement of claim "for use on large estates" is vague and misleading, and might lead to disappointment. An examination of the claim made in the form of entry shows that it should have read "for use on cricket grounds and other practically level pleasure grounds." For such purposes the machine proved itself to be well adapted and will undoubtedly fill a great want. It is driven by a Simms petrol engine of 6 H.P., fitted with magneto ignition and water cooler. It is also fitted with reversing motion, and this and the driving, steering, and grass box clearing motions are all brought ready to the hand of the driver who rides upon the machine over the small back steering roller. By reason of its weight the machine is an effective roller as well as mower.

Article 3092.—*Aktiebolaget Pump Separator*, Kt. S. Kyrkogata 13A, Stockholm. "Hand Cream Separator, 'Pump Separator,' skimming 66 gallons an hour, in combination with a pump coupled direct to the driving wheel of the separator so that the milk is continually and evenly pumped into the bowl in direct relation to the speed of the handle. By this arrangement the skimming will always be even and uniform, whether the separator is worked at uniform speed or not." Price 16*l.*

This is one of the latest novelties among cream separators (Fig. 5). In many respects it is built on entirely new principles. Hitherto, the best-known systems have the Alfa or similar interiors, *i.e.*, inclined plates. With these it

is necessary to have a certain distance between the plates as two opposite currents meet between each, viz., the whole milk passing from the centre to the outside, and the cream from

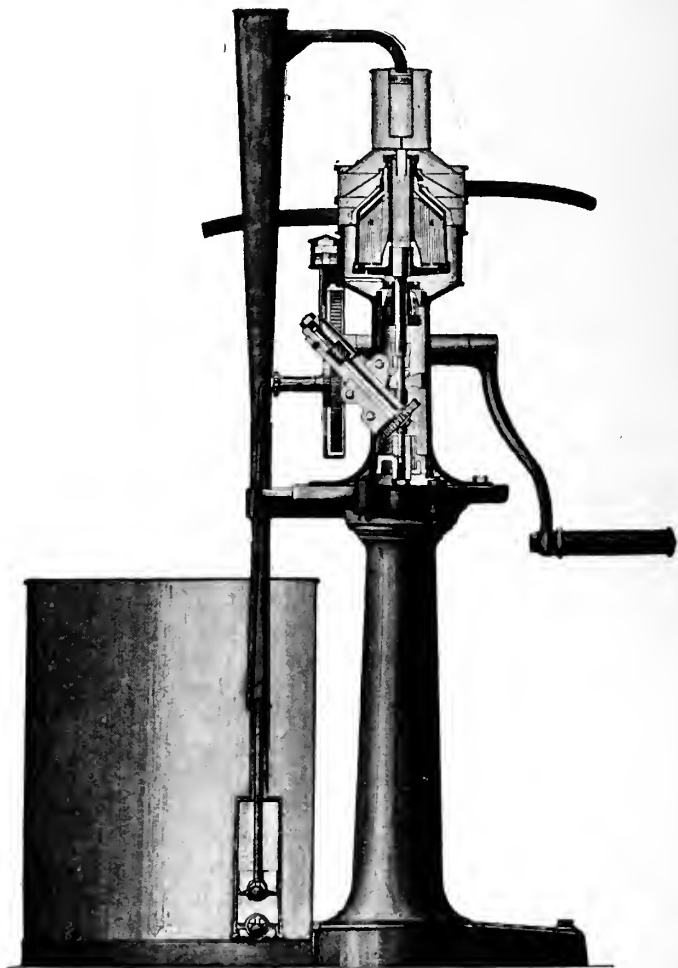


FIG. 5.—Pump Separator (Article 3092).

the outside to the centre. The inventors of the pump separator have chosen another system of interior of bowl, in dividing up the bowl by a great number of vertical, parabolic blades (Figs. 6, 7, and 8). In this arrangement the whole milk enters at the bottom and gets separated on its way to the top, that is,

the separated milk goes upwards and outwards, the cream goes upwards and inwards. On this account, so say the makers, it is possible to have a much greater number of partitions, and thus get the milk divided up into thinner sheets. The milk in the bowl of the pump separator is divided up into seventy layers of about $\frac{1}{64}$ in. thickness. This arrangement of the bowl gives the pump separator a much greater capacity than other separators of the same size. For instance, the weight of the pump separator for skimming 66 gallons an hour is 40 lb. (without pillar), and the size of bowl is only $3\frac{5}{8}$ in. diameter, and $2\frac{1}{4}$ in. in height.

In spite of the great number of plates the bowl can be easily cleaned and assembled. The seventy blades in the bowl are all threaded on a ring at their upper inner corner, like keys on a key ring. Each single blade is entirely free from its neighbours, and the whole lot of blades is quickly and conveniently cleaned simply by being shaken in hot water

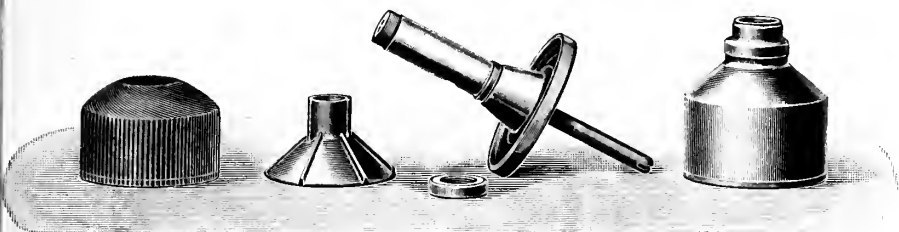


FIG. 6.—Parts of Pump Separator (Article 3092).

(Fig. 8). The assembling ring is parted (like a key ring), enabling any blade to be removed and another substituted in case of damage. The blades are all alike and can be inserted anywhere; they centre themselves automatically, and the bowl is absolutely self-balancing. This is by no means the least advantage of this system of construction.

A new idea is the combination of the pump separator with an automatic feeding device for the milk. A very simple pump is driven direct from the handle motion, feeding the separator automatically from a vessel of any size, placed on the floor close to the machine. The stroke of the pump, and therefore the ratio of feed to revolutions of bowl in order to separate the stipulated quantity of milk at the stipulated speed, is adjusted and marked at the factory. Variations in speed are therefore of little importance, as the feed of milk and the speed of bowl always keep proportional.

The automatic feed has also the advantage of acting as a speed indicator. The small receiving cup on the top of the separator is graduated, and has the correct milk level for the capacity and speed clearly marked; so that when working at the correct speed the milk entering the cup will rise just up to the mark. If the milk level goes below the mark, it shows that the handle is being turned too slowly, and

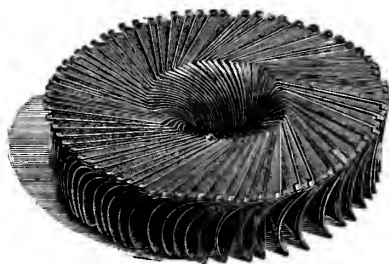


FIG. 7.—Blades of Pump Separator (Article 3092).

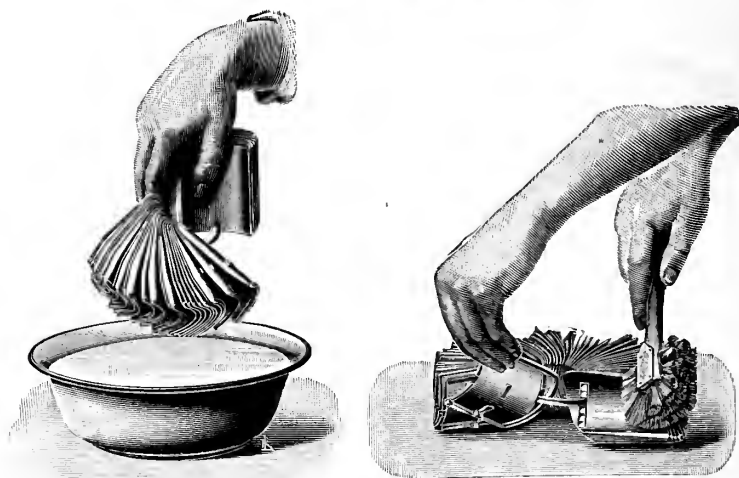


FIG. 8.—Method of cleaning blades of Pump Separator (Article 3092).

vice versa. The capacity of the machine can be easily regulated by altering the stroke of the pump, which can be done at any time in a few seconds. If the stroke is increased and the same speed of revolution is maintained the milk will rise to a higher level in the receiving cup, and the rate of feed will be proportionately increased. Thus, by increasing the capacity, more fat will be left in the skim milk, &c.

Another novelty with the Pump Separator is the arrangement of the gearing. The driving gear, a spur wheel, engages a worm or skew gear on an intermediate shaft placed at an angle of 45° to the driving shaft and to the vertical spindle. At the other end of the intermediate shaft a second spur wheel matches into a worm formed upon a sleeve sliding freely upon the vertical spindle. When the machine is started this worm sleeve is lifted automatically until its upper end, which is serrated, engages with similar serrations upon the vertical spindle, driving it thereby; but the moment the driving handle is checked or stopped the sleeve again falls, the teeth disengage, and the vertical spindle and bowl continue to run freely; all the gearing comes instantly to rest with the handle. It will be seen that the drive has a tendency to lift the bowl and spindle, taking some of their weight off the footstep. The vertical worm being free can be replaced in case of wear without having a new spindle.

This machine was tested in the Dairy at the Showyard with the following results:—

Stated capacity of machine	. . .	66 gallons an hour.
Duration of trial	. . .	30 minutes.
Temperature of milk.	. . .	95° to 97° F.
Total milk separated.	. . .	326 lb., say $32\frac{1}{2}$ gallons.
Separated milk.	. . .	$293\frac{1}{2}$ lb.
Cream	. . .	$32\frac{1}{2}$ lb.
Fat in sample of separated milk	. . .	0.05 per cent.

The workmanship of this separator is of a very high standard, and the ease with which it is driven, as well as its large capacity for small size, is quite remarkable. The pump is very simple and most easy to clean, and in addition to all the other good qualities of the Pump Separator it is undoubtedly a convenience not to have to lift the milk by hand into a receiver placed above the separator, which generally necessitates the presence of a second attendant.

Article 4351.—*Mr. James R. Hatmaker*, 28 Boulevard Malesherbes, Paris. “Milk Drying Machine, manufactured by Messrs. James Milne & Son, Ltd., Edinburgh.”—It is not often that the farmer comes face to face with such a startling innovation as was presented to him in this machine, which was shown in operation almost continually during the week of the Show. Many were the gloomy forebodings heard on all sides as to its probable effect upon the trade of the dairy farmer.

The machine consists of two cast-iron cylinders, 28 in. in diameter and 60 in. long, truly turned and polished, having

their axes parallel, and in the same plane, and separated about one-eighth of an inch from one another. The cylinders are internally heated by steam, maintained at 40 lb. pressure, to a surface temperature of 220-230° F. They rotate in the direction shown by the arrows in Fig. 9 at a speed of six or seven revolutions a minute. The milk is fed gradually from a perforated pipe overhead into the trough formed between the two rollers. It is prevented from falling through the space

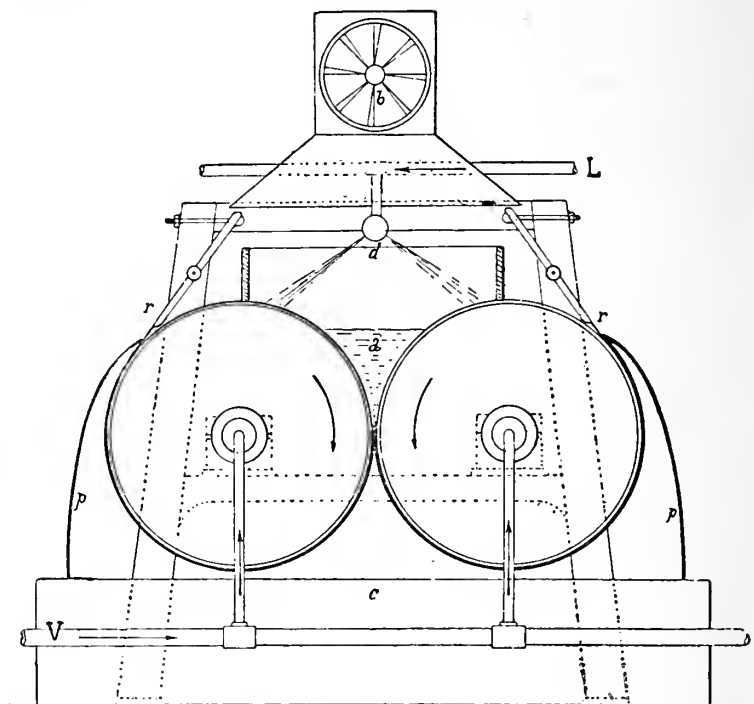


FIG. 9.—Milk drying Machine (Article 4351).

between the two cylinders by the rapid generation of steam from the water in the milk, but a thin uniform film of semi-dried milk adheres on the surface of each cylinder and is carried thereon for about half a revolution. By the time the milk is almost dry it reaches the point where the edges of the stripping knives (*r*) rest upon the surface of the cylinders. These knives remove the film of milk in thin continuous sheets (*p*) which become dry instantly upon cooling. The dry milk is then reduced to uniform powder by being passed through a sieve.

A mere mechanical description of the process *quasi* machine fails to convey a proper idea of the problems involved, which concern the chemist and bacteriologist more than the mechanic. I therefore give the following extracts from a letter received from Mr. Hatmaker in reply to my request for information:—

This is the first process whereby milk has been dried rapidly and which has employed a temperature in excess of 212° F. Previous processes have limited themselves to much lower temperatures, for it has always been taught and believed that milk could not be dried successfully by the use of a high temperature.

But the truth is the reverse: milk cannot be dried successfully except by the employment of a high temperature. Milk is a very changeable liquid, which is not at all suited to slow methods—particularly to slow methods employing heat—for under such conditions bacterial development is very rapid, and very detrimental changes occur in the milk constituents. For this reason no good dry milk has ever been obtained by a slow process. The Just-Hatmaker process is based upon the discovery that milk can be reduced to dryness almost instantaneously, without in any way injuring the most delicate of its constituents, if it is suitably exposed to the influence of a temperature in excess of 212° F. In carrying it out, milk at an ordinary temperature is allowed to fall continuously in thin streams between two slightly separated revolving cylinders having a surface temperature above the boiling point of water. In accordance with the principle of the evaporation of liquids the high temperature of the cylinders causes the continuous formation of a layer of steam upon their surfaces, which keeps the solid constituents of the milk from direct contact with the said surfaces. The escape of the steam thus generated keeps the limited quantity of milk that is maintained between the cylinders in violent agitation. The somewhat condensed milk is drawn between the cylinders as they revolve and is spread out in a thin uniform film and carried thereon until nearly all its water is driven off.

The exposure must not be too long, for it must not be overlooked that dry milk contains a large percentage of milk-sugar and also milk-salts—substances requiring water of crystallisation. To ensure the preservation of the milk solids in a normal state the hot film must be removed from the highly-heated cylinders while it is somewhat moist.

The moisture disappears immediately upon cooling and the dry milk is then easily reduced to a uniform powder by being passed through a sieve. This milk is almost instantaneously deprived of its unnecessary water and rendered into dry preservable form without in any way injuring its nutritive qualities. The process thus makes milk a staple concentrated food which can be quoted in the markets of the world like flour and other staple foods.

But, happily, the process goes further—it rids milk of all its dangers and makes it an absolutely safe food for infants and others by completely destroying all its germs. It has been proved repeatedly that no germs can survive the process. The dry milk as it issues from the drying machine is absolutely sterile. This means nothing less than the absolute prevention of the communication of all diseases through milk.

The commercial article as now placed on the market consists of either whole milk, separated milk, or a mixture of the two, the latter being the one probably most suitable for reconstruction by the addition of water into milk for general use. As one hundred parts of weight of new milk contain twelve and a half parts by weight of solids, the dried milk

powder must be reconstituted by the addition of seven times its weight of water.

The milk reconstituted with hot water and then rapidly cooled is excellent, and is hardly distinguishable from fresh milk. That it is likely to prove a serious competitor to the fresh milk trade in the large towns seems extremely doubtful ; but that it will prove invaluable to people living on board ship and in countries where fresh milk is not obtainable seems certain. It should therefore be looked upon by the farmer with favour instead of dread as offering him additional markets for his milk.

AGRICULTURAL ENGINES.

Article 328.—*Messrs. James B. Petter & Sons, Ltd.*, Yeovil, Somerset ; and 73a, Queen Victoria Street, London, E.C. “‘Handy-man’ Portable Petroleum Engine,” 1½ B.H.P. Price 42*l.*—A short length of shafting is mounted in bearings upon the base of the engine at right angles to the crank shaft, from which it is driven by worm gearing, thus making the speed of the shaft that which is usual for the lower drum of a hay elevator. The engine is intended to take the place of the horse power gear and to be coupled up to the elevator by the usual shafts and universal joints. It is also fitted with a pulley for doing such other light driving as may be within the power of the engine.

Article 438.—*Messrs. Bomford & Evershed, Ltd.*, Atlas Works, Pershore. “Steam Waggon ; Load 5 tons.” Price 550*l.*—In this waggon the locomotive type of boiler is used. It is set athwart the front end of the waggon, and the firing door is therefore at one side of the fire box. This results in a very convenient driving and firing platform and ready access for the sweeping of tubes. The good qualities of the locomotive type of boiler are too well known to require any further commendation.

Article 469.—*Messrs. T. G. Slipper & Co.*, Brundall, Norwich. “‘Eli’ Petrol Engine. Manufactured for the exhibitors in the United States. 2 H.P. Simple in construction, without gears, cams, lever, or any valve mechanism whatever. Makes an explosion at every revolution of the crank when under full load. Moving parts are automatically oiled.” Price 32*l.* 10*s.*—This handy little horizontal motor is constructed on the well-known principle of Day’s Gas Engine, but the design is entirely changed. The front end of the cylinder is fitted with a cover and gland through which passes

the piston rod. The cross head, guides, and crank are all enclosed, and lubrication to these is by splash from the crank chamber. Below the front half of cylinder and in the casting forming the base is an air box through which the charge of air and vapour of petrol is sucked into the forward half of cylinder by the receding piston, and in which it is slightly compressed when the piston again advances. At the forward end of its stroke the piston first uncovers the exhaust port and immediately afterwards the admission port from the air box. The slightly compressed charge, rushing into the cylinder under a suitable deflecting plate upon the rear end of the piston, sweeps out the remaining products of combustion and fills the after end of the cylinder. The charge is then compressed by the returning piston. Passing through the centre of the back end cylinder cover is an insulating bushing through which passes a long straight firing pin held forward to its proper position by a spiral spring. This pin can be almost instantly removed and replaced.

One wire of the electric firing circuit is attached to this pin and the other wire to the engine frame. The piston at the back end of its stroke comes in contact with this pin, pushing it slightly backwards and completing the electric circuit. As the piston advances the circuit is again broken and firing of the charge takes place. The amount of the charge drawn into the cylinder can be regulated by a valve placed between the air box and the cylinder. The petrol tank is a shallow rectangular box placed in front of the air box under the cross head guides. The object aimed at by the makers has been to provide the most simple engine possible; and it promises to be a very satisfactory motor for small power where high efficiency is not of much importance.

Articles 678 and 679.—*Messrs. Ruston, Proctor & Co., Ltd.*, Sheaf Iron Works, Lincoln. "Oil Engines for Crude Oil, 8 B.H.P." Price 178*l.*; 25 B.H.P., 305*l.*—The difficulties of using crude oil in an oil engine in consequence of the vaporiser fouling with the deposits of carbon are well known. It is claimed that with the new design of vaporiser used in this engine cleaning is only required about once a month instead of almost daily, as is usually the case. Any kind of oil from benzene and kerosene to crude oil, whether from Texas or Russia, may be used. The arrangement of the vaporiser is shown in the illustration (Fig. 10), which gives various sections. (A) is an extension of the combustion chamber of the cylinder,

which communicates with it by the passage (A_1). The air for vaporising the oil enters through the inlet (C), and passes across the tube (D) supplying the oil, and which will be sprayed on to the surface (E_1), forming the roof of the chamber (A). The resulting vapour passes along E to F, and so to the valve (B). Simultaneously with the drawing in of the charge on the outward stroke of the engine, air is drawn in also through the main air valve. On the return stroke the charge is compressed into the chamber (A) and the extension (H). This extension is made thin (about one-third to one-fourth of the thickness of the main body of (A)) becomes highly heated by the successive explosions, and is prevented from cooling by the cover (J), which has an asbestos lining (K). At or about the extreme moment of compression the heat of (H) fires the charge automatically, and the piston begins its explosion stroke. The

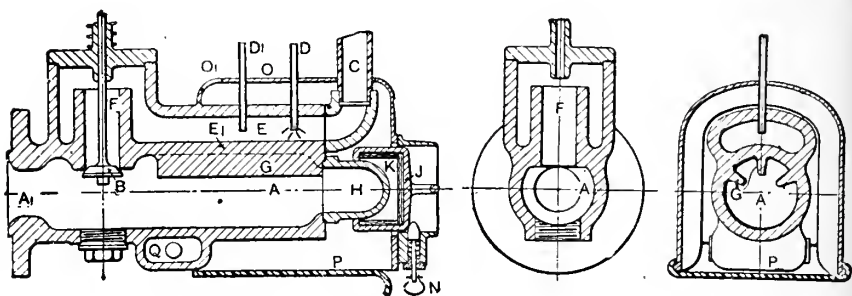
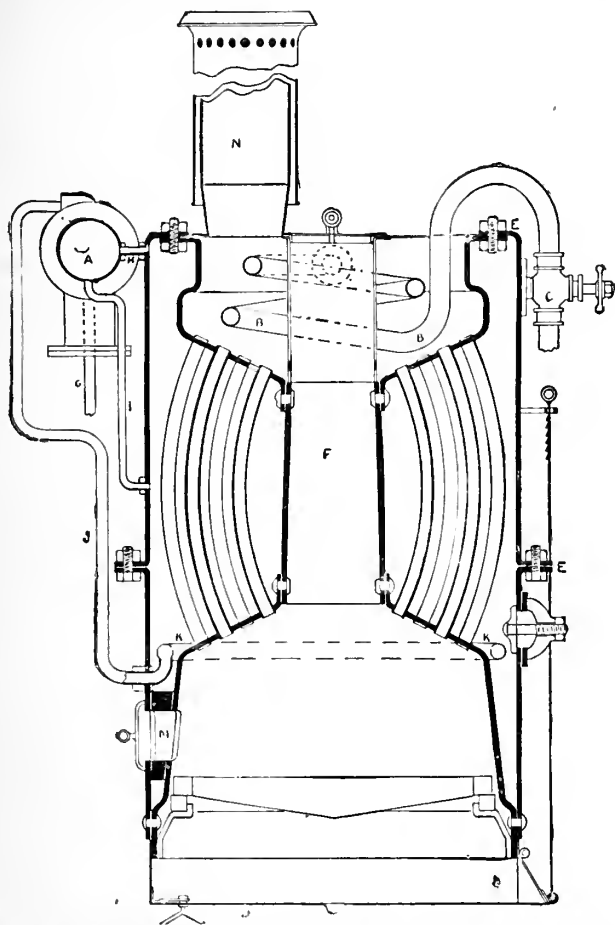


FIG. 10.—Sections of Vaporiser for Oil Engine (Articles 678 and 679).

degree of heat desirable in the extension (H) may be regulated by drawing back more or less the cover (J), which a spring catch (N) keeps in any desired position; the chamber (A) and the vaporiser (E) are protected by a cover (OO), and this cover is closed in by a sliding lid (P) on the under side. When starting the engine this lid is pulled away, and a lamp is placed underneath, the cover (J) is drawn back so as to expose the extension (H), and the whole is heated in the usual manner. An outlet (O_1) is made in the cover (OO), so as to compel the flames of the lamp to envelop the chamber (A) and the vaporising passages.

Article 816.—*Messrs. Jesse Ellis & Co., Ltd.*, Invicta Works, Maidstone. "Ellis-Balmforth Patent Vertical Fire Tube Boiler, for Steam Motor Waggons; heating surface 90 square feet; grate area $3\frac{1}{2}$ square feet; efficiency 8 lb. of

steam to 1 lb. of coke, and 8 lb. of steam per square foot of heating surface ; working pressure 200 lb. ; water capacity 460 lb. ; tested to 400 lb." Price 65*l*.—Amongst vertical



A, Patent Feed water heater and filter, delivering water to boiler free from sediment and at an approximate temperature of 250 to 300 degrees. B, Steam Dryer receiving heat of fire after leaving tubes. C, Stop Valve. D, Hinged ash pit door. E, Bolted joints for removing outer shell. F, Central Feeder. G, Cold water from pump. H, Live steam to feed water heater. I, Condensed water back to boiler. J, Hot feed water pipe. K, Perforated feed pipe spraying the water into boiler equally all round. L, Cleaning doors 3 at 120 degrees. M, Clinker door. N, Chimney with outer casing and air space

FIG. 11.—Vertical Fire Tube Boiler (Article 816).

boilers for motor waggon use this boiler shows in a very marked degree those elements of design which mean success in practical working. There appears to be a total absence of all possibility of stress, and therefore of probability of

trouble from leaking tube ends, whilst the facility of access to all parts for cleaning and repairs promises a small cost of maintenance. The construction is so well shown by the sectional illustration (Fig. 11) that further description is unnecessary.

Article 3321.—*Messrs. Richard Garrett & Sons, Ltd.*, Leiston Works, Leiston, Suffolk. “Engine, semi-portable, No. 14, single cylinder, fitted with automatic expansion gear and patent superheater.” Price 394*l.*—The economy of fuel to be obtained from superheating is now so well established that it is satisfactory to see that it is coming within range of adoption in the ordinary agricultural steam engine. The system used in this case is that known as “Schmitt’s,” in which the steam is superheated in a number of tubes placed in the smoke-box which is made longer than usual.

Articles 3927 and 3928.—*Messrs. H. P. Saunderson & Co., Ltd.*, Elstow Works, Bedford.

Article 3927.—“Agricultural Motor, 10 B.H.P. Complete on two wheels that both drive and steer, and may be used as a fore-carriage in place of the front wheels of any existing vehicle or machine. Attached to a mower the two wheels of the mower form the back wheels of the motor, making a four wheeled motor mower, and so on with binders, ploughs, or any implement or machine whatever, and at once brings every operation performed by horses into the scope of motor power. It will also drive all kinds of machinery by belt. Exhibited with complement of attachments.” Price 250*l.*

Article 3928.—“The ‘Elstow’ Portable Oil and Spirit Motor, 5 B.H.P. Will burn oil, petrol, or other spirit, mounted on patent hollow base holding the cooling water, forming a light and powerful motor complete in itself that can be used as a fixture, or mounted on wheels for driving farm machinery, separators, elevators, grinders, chaff-cutters, &c.” Price 45*l.*

Messrs. H. P. Saunderson & Co. make a line of strong simple spirit engines suitable for farm use, and one of these very conveniently mounted is the subject of the second exhibit. There is no separate carburettor, but the spirit is admitted through a small hole in the seat of the admission valve. They are fitted with controlled electric ignition. If it is desired to use oil instead of spirit they are fitted with tube ignition, vapouriser and lamp. Beyond their general good qualities there is nothing calling for special remark.

In Article 3927, one of these engines is mounted as a motor tractor upon two driving wheels and a narrow frame extending to the rear. The rear end of the frame may be supported either by a third wheel or it may be rigidly attached to the pole of a mower or self-binding reaper, or to a two wheeled lorry body. The engine drives the two wheels through the intermediary of a gear box giving three speeds and a reverse, the second shaft of the gear being coupled at either end by universally jointed shafts to the wheels. There is no differential motion. The wheels

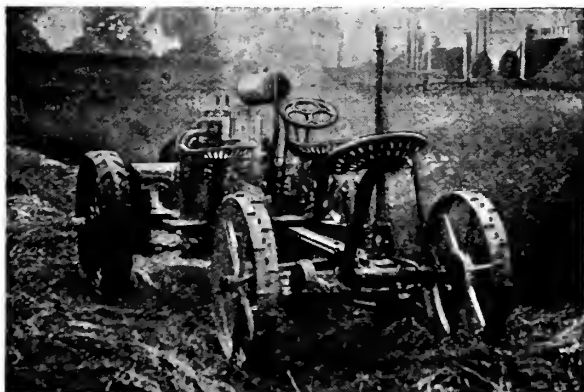


FIG. 12.—Agricultural Motor attached to Mower (Article 3927).

are mounted on L-shaped axles and are coupled together for steering on the Ackerman principle. The whole arrangement at present is very crude, but it is evidently capable of development, and the Judges recommended that it should be allowed to be again entered as a "New Implement" next year.

Article 4000.—*Diplock's Patent Traction Engine Haulage Syndicate, Ltd.*, 61 Marsham Street, Westminster, S.W. "Pedrail Steam Tractor, manufactured by Messrs. Wm. Foster & Co., Ltd., of Lincoln. Single Cylinder Engine, cylinder 6 in., diameter, 9 in. stroke; hind portion of engine mounted upon Diplock's patent pedrails, complete with winding drum, brake on both pedrails, compensation gear, usual tender, coal bunker, &c. Working pressure of boiler 160 per square inch." Price 1,400*l.* This most ingenious machine (Fig. 13), teeming with interest to the mechanical engineer, and no less so to the student of anatomy, was undoubtedly one of the greatest attractions of the Show. It is an example of the successful application of the principles of nature to mechanical traction.

The principle is largely the reverse of the railway; thus the sleepers are replaced by feet carried at the ends of the spokes of the driving wheel of the engine and placed successively on the ground, as required, and again removed. Each of these feet carries a wheel or roller upon which rails mounted on the engine (or carriage) slide. A man or an animal when walking so places his feet in succession upon the earth that they may form foundations over which he may move. The effort required for his forward motion is applied through these foundations, but the actual motion takes place in, about, and over the ankle, a beautiful form of ball and socket joint. So in the

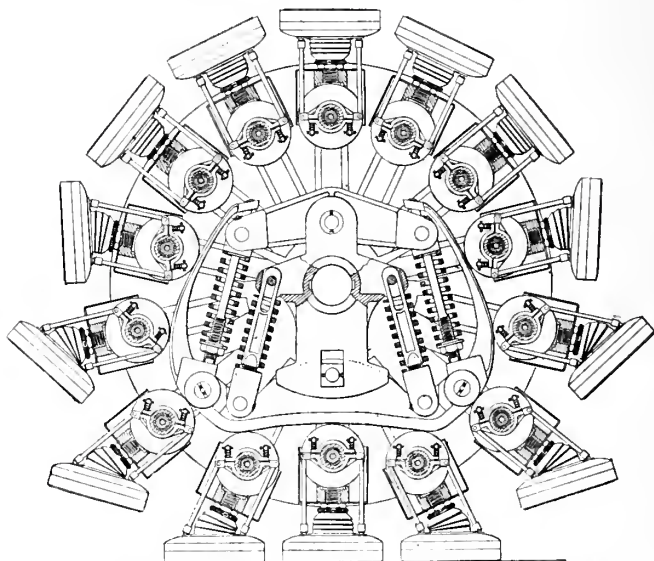


FIG. 13.—Internal Mechanism of Pedrail Steam Tractor (Article 4000).

pedrail the action of a man or animal walking is mechanically imitated. The feet have ankles about which the forward motion may take place. Rods and springs replace the sinews and muscles which enable each foot to adapt itself to the inequalities of the ground on which it is placed, whilst the spokes of the wheel take the place of the legs and complete the simile.

It is impossible in the space at my disposal to describe all the mechanical details; suffice it to say that each foot with its ankle and roller, makes a point upon which the rail can slide.

The rail which is of peculiar shape, something between a horse-shoe and a heart, is very short, only about 3 ft. long, enough to cover three rollers at any time; and as it is evident that owing to the inequalities of the ground the three rollers will hardly ever be at the same level, the rail is made to swing about a pivot or axis, and to adapt itself to the ever varying inclines from one roller to the other.

The advantages claimed are:—

1. Great saving in power, the resistance to motion being more comparable with that encountered by a railway locomotive, than by a road traction engine.

2. No damage to road surfaces, the floating area of the feet being largely in excess of the area of the portion of a wheel in contact with the road.

3. Greater tractive power, due to better adhesion, and at the same time no slipping or skidding.

4. Ploughing and cultivating machinery hauled direct without wire rope plant, as is usually the case.

5. The first example of "Animal Mechanism," the great flexibility, and consequent durability more than compensating for increased complexity.

6. Great saving in capital outlay. The conditions of a tram-road being self-contained in the rolling stock, the whole capital outlay on permanent-way is thus saved. The Pedrail System is applicable to the waggons, as well as the engine.

These claims are hardly likely to be accepted by the agriculturist, with whose needs we are chiefly concerned, at all events in this country. The point that a permanent-way once laid is good for many engines and many loads, with but small wear and tear, should not be overlooked; also the fact that the cost of the roads falls on the general rates and not on the individual users of them.

Claims 2, 3, and 4 are undoubtedly true, and many cases can be conceived where circumstances would render the use of the pedrail distinctly preferable to the traction engine.

The inventor must be congratulated on the successful working out of a very interesting and difficult problem.

DAIRYING APPLIANCES.

Article 1175.—*The Dairy Supply Co., Ltd.*, 28 Museum Street, London, W.C. "‘Alfa Viola’ Cream Separator." Price 8*l.*—The Alpha Laval Separator has been such a great favourite that it is a pleasure to note an improvement which will add to its good qualities. The new feature is that the bowl is independent of the spindle and worm screw, which remain in position; thus the risk of injury to the spindle is avoided and the bowl is made more convenient to handle.

Articles 2774 and 2775.—*Messrs. Wilhelm Meinhardt & Co.*, 5 Lloyd's Avenue, London, E.C. Article 2774.—

"Centrifugal Churn." Price 2*l.* 10*s.*—Contents 4½ gallons. Article 2775.—"‘Peerless’ Milk Pasteuriser, Steriliser, and Heater." Price 30*l.*—Capacity No. 1, 55 gallons per hour.

These two distinct novelties promised to be among the most interesting in the Show, but the entries proved to be incorrect, and the person in charge of the exhibits did not properly understand how to operate them; consequently the trials of both proved abortive. The Judges recommended the exhibitors to ask permission to re-enter them as New Implements next year.

Article 2878.—*The Alexandra Separator Co.*, 90 Great Russell Street, London, W.C. "‘Alexandra’ Cream Separator. Capacity 65 gallons per hour." Price 20*l.*—This well-known separator has been improved by the combination of the Laval discs with the Alexandra self-balancing bowl.

Article 3030.—*Messrs. Burmeister & Wain*, 12 Coleman Street, London, E.C. "Railway Milk Can, 12 gallons, practically made in one piece; can be retinned." Price 1*l.* 2*s.* 6*d.* It is satisfactory to see at last an attempt to improve the railway milk can; the claim, however, is somewhat too optimistic; the body is in one piece but the bottom is inserted, and it is, therefore, open to question whether it can be economically retinned. It is certainly a great advance on the usual types, but seeing that steel barrels are now made entirely out of one piece of pressed steel there can be no reason, unless it be the cost, why milk cans should not also be so made.

Article 3078.—*Globe Separator British and Australasian Agency*, 3 Lloyd’s Avenue, London, E.C. "Globe Cream Separator No. 1, manufactured by the Aktiebolaget Rotator Stockholm; capacity 20 gallons per hour." Price 7*l.* 2*s.* 6*d.*—The skimming in this separator is done by a number of curved blades hinged on a central part as shown in the illustration (Fig. 14) and styled by the makers "Linked Blades." In their disposition these blades bear a considerable resemblance

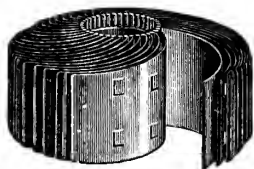


FIG. 14.—Linked Blades
(Article 3078).

to those of the Pump Separator before mentioned, and doubtless give a high efficiency; but they would not be quite so easy to clean.

SWATH TURNERS.

Four swath turners were entered as New Implements, viz., Articles 102, 157, 552, and 1503.

Article 102.—*Messrs. Blackstone & Co., Ltd.*, Rutland Works, Stamford. “Latest model.” Price 15*l.* 15*s.*—This implement is constructed on the principle of feathering hay rakes, which could be revolved to either hand, or both drums could turn inwards or outwards. The change is effected almost instantly, and these points might be of considerable value in collecting.

Article 157.—*Messrs. Sargeant & Co., Ltd.*, South Bridge Works, Northampton. “For turning two swaths simultaneously, the turning mechanism being arranged in front of the driver and placed under his control.” “Standard.” Price 16*l.*—A single ring of spring tines on each drum, partially supported and protected by second skeleton drums on their after side revolving with, but eccentrically to, the main drums, and acting as strippers to the spring tines so as to strip the crop from the tines as each recedes from the earth. This machine was not adapted for collecting.

Article 552.—*Messrs. J. & F. Howard*, Britannia Iron Works, Bedford. “Single Swath Turner.” Price 13*l.* 13*s.*—A single drum only, turning one swath at a time. This is very heavy in construction, and the drum revolves much too fast, making very hard work for a horse; hence the reason for making it a single machine only.

Article 1503.—*Martin's Cultivator Co.*, Lincolnshire Iron Works, Stamford. “Martin's Patent.” Price 16*l.*—This machine was shown last year, but there being then no

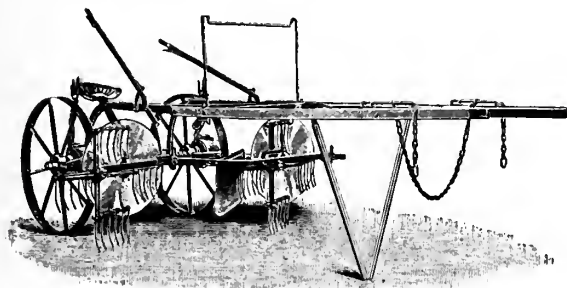


FIG. 15.—Swath Turner (Article 1503).

opportunity for trial, permission was given to re-enter as a New Implement this year. The machine was described in last year's Journal, Vol. 64, pp. 238, 239, Article 1400, then exhibited by The Harrison Patents Co., Ltd. The illustration (Fig. 15) now given will help to make the description intelligible.

The Judges had these four machines out for trial upon the farm of Mr. George Earley, Manor Farm, Yeading, Hayes. The field was a good fair crop of clover, cut with a view to its being in the right condition for first turning at the time of the trial. All the machines were well tried as swath turners, and afterwards an attempt was made by each at collecting, for which, however, none of them was suitable.

As swath turners it cannot be said that any of the first three did satisfactory work, but No. 1503, Martin's, acquitted itself thoroughly well, turning the swath neatly, gently, and lightly, and well over on to the dry ground.

The principal improvements in this machine since last year consist in placing discs or wind guards on the rear end of the turners; in each turner having four arms and rakes instead of six; and in increasing the length of the rakes, thus giving the machine about six inches wider raking surface than before.

TURNWREST PLOUGH.

Article 724.—*Messrs. Richard Hornsby & Sons, Ltd., Spittlegate Iron Works, Grantham. "Plough H.T., Turnwrest."* Price 9*l.*—This appears to be a thoroughly well-made plough for leaving the furrows all the same way, so making a level

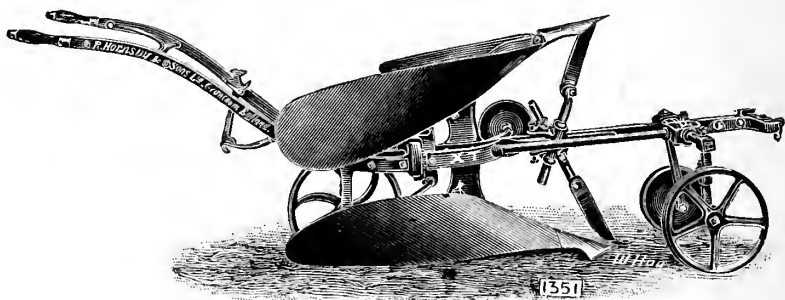


FIG. 16.—Turnwrest Plough (Article 724).

land, and, therefore, one better adapted to the working of the harvester afterwards. All the movable parts are locked in position by a single bolt, which can be withdrawn by the lever seen in front of the spanner in the illustration (Fig. 16).

When turning at the headland the ploughman presses on this lever, thus releasing all the movable parts; the pull of the horses causes the body and breasts to make a half revolution around the beam, and, simultaneously, two bevel toothed wheels make the land and furrow wheels revolve around the central

horizontal portion of their axle, thus bringing them into the required position for use with the other breast.

DRILLS FOR ATTACHING TO PLOUGHS.

The idea of attaching a drill to the beam of a plough so that the corn is sown in front of the breast of the plough, and therefore immediately covered is not a new one; but the advantages of the system under certain conditions were doubtless brought into prominence by the unparalleled difficulties of the sowing season, 1903-4, with the result that two drills for this purpose were exhibited this year.

Article 823.—*Mr. W. B. Baker*, Priory Iron Works, Bedford. “‘Triumph’ Drill, for attaching to the front of a plough.” Price 1*l.* 10*s.*

Article 3095.—*Messrs. E. Page & Co.*, Victoria and Bedford Iron Works, Bedford. “‘Eclipse’ Patent Drill, for attaching to ploughs of every description, to drill in front of the share. It sows beans, peas, maize, barley, or wheat. All seeds are delivered by one cog-wheel. The quantity sown is regulated by adjustable slides. It stops automatically on turning the headlands. As there is no coulter it cannot clog under any conditions of land or weather.” Price 1*l.* 18*s.* 6*d.*

Both of the above were entered as “New Implements,” and, doubtless, from each maker’s point of view they were such, but in what material points they differ from others in use many years ago the writer is not able to say. The principle of both is the same—a seed box to be attached to the beam of the plough, with means of adjustment for regulating the exact point at which the seed shall fall in reference to the furrow, and fitted with suitable seed distributor. The distributor is driven in the “Triumph” drill by friction from either wheel of the plough, preferably from the furrow wheel, and in Page’s Drill by being directly coupled by shaft and universal joint to the axle of the land wheel.

Owing to the frequently uneven surface of the land this latter drive strikes one as liable to be very irregular; the drive, by friction in the case of the “Triumph,” must also at times be liable to slip, but is nevertheless, when using the furrow wheel, probably the better drive of the two. Distribution on the “Triumph” is of the eup plate type, that of Page’s being of the cogged wheel type.

As a general rule these plough drills are not likely to be much used except for beans, but in a persistently wet season

the possibility of being able to sow whenever the land can be ploughed may literally mean the saving of the crop.

ROOT CLEANERS AND GRATERS.

Articles 357 and 358.—*Messrs. Bamford & Sons*, Leighton Iron Works, Uttoxeter.

Article 357.—“Root Cleaner and Grater, P. 8, for hand power. The roots are agitated by two revolving barrels so as to remove dirt and stones before they are cut up.” Price 7*l*.

Article 358.—“Root Cleaner and Grater, P. 10, for steam or oil engine or horse gears. Similar to the above.” Price 14*l*. 10*s*.

The rotary motion of the barrels agitates the roots in such a manner that they are effectively cleaned whilst being gradually conveyed to the cutting disc of the pulper.

POTATO DIGGER.

Article 924.—*Messrs. A. Newlands & Son*, Provost Road, Linlithgow. “Potato Digger, with pronged shaker and pole.” Price 18*l*.—In this digger the usual revolving arms are replaced by a shaker hinged behind the share. The rapid up and down or angular movement of this shaker separates the potatoes from the earth in much the same manner as in hand forking. The earth falls through the shaker, while the potatoes eventually roll over the points of the prongs and fall on the top of the earth. It is claimed that it is the only digger which will lift early or green sale potatoes; that they are not scattered over a wide area and so are much more easily gathered; and that the draught of the machine is considerably less than in other types.

HORSE HOE.

Article 928.—*Messrs. P. J. Parmiter & Co.*, Station Works, Tisbury, Wilts. “Patent Flexible Two-Row Horse Hoe. The screw and spring adjustment allows expansion or contraction to suit any width of drill.” Price 10*l*.—The arrangement is well shown by the illustration (Fig 17). Any number of sections from one to five may be fitted. Each section works independently as a single horse hoe, giving, it is claimed, a level cut of even depth on uneven or ridge and furrow land. The construction of the machine struck the Judges as erring on the side of lightness.

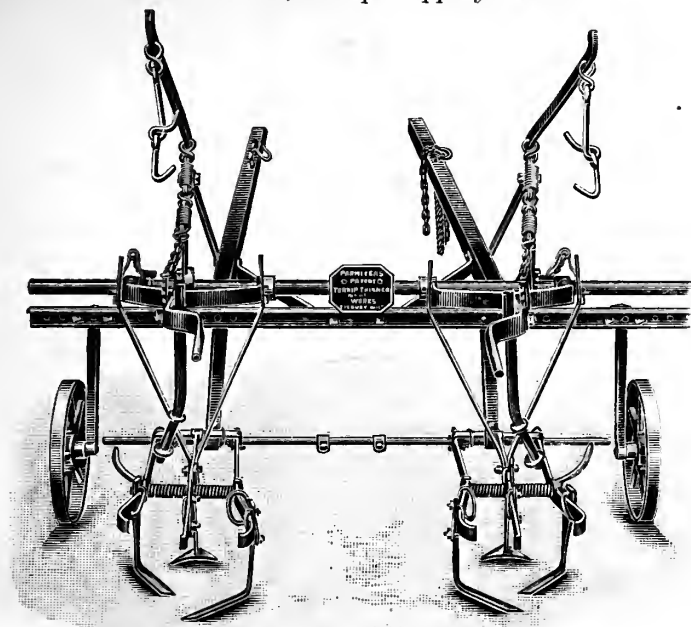


FIG. 17.—Flexible Two-Row Horse Hoe (Article 928).

MISCELLANEOUS.

Article 439.—*Messrs. Bomford & Evershed, Ltd., Atlas Works, Pershore.* “Clover Sheller. New design for threshing and drawing the seed at one operation.” Price 130*l.*—The novelty in this machine, for which much convenience and efficiency are claimed, lies principally in the placing of the threshing and shelling drums on the same spindle, by which means the difficulties of driving the second drum by a very short and tight belt from the former are avoided. The machine is divided longitudinally into two compartments, the one being the threshing side, the other the shelling side; and as threshing can be done much faster than shelling, the threshing drum is made 2 ft. long and the shelling drum 4 ft. long, both being on the same spindle as stated. The rest of the machine includes the usual riddles, fans, elevators, &c., necessary for the final delivery of the seed in three samples into sacks. The frame of the machine measures 13 ft. long by 6 ft. wide; it is said to be easily driven by a 6 H.P. engine, and the total weight is 2 tons 10 cwt.

Article 2389.—*Messrs. J. & R. Wallace, Castle Douglas, Kirkcudbrightshire.* “Sheep Dipping Machine.”—This is

semi-portable, and consists of a bath made of galvanised iron, which is let into the ground, its top edge flush with the surface of the earth. Mounted upon and above the bath is an iron framework in which is guided a perforated galvanised iron cage, into which the sheep enters and is lowered into the dip. The weight of the sheep and cage is counterbalanced by a bucket of water suspended within an empty cask which acts as a fence around it. (Fig. 18).

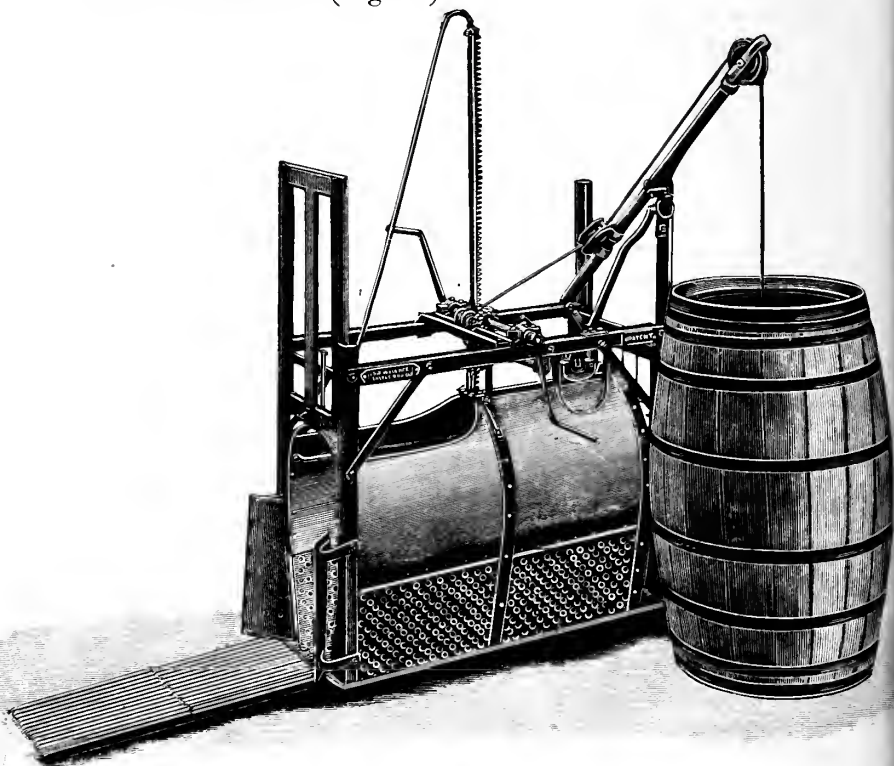


FIG. 18.—Sheep Dipping Machine (Article 2389).

It is claimed that by this arrangement there is no handling of ewes in lamb or abuse of any kind ; that the opening and closing of the doors of the cage being automatic, only two men are required ; and that 200 heavy sheep can be dipped per hour. The last part of this claim appears to be impossible if the dipping is to be efficacious.

Article 3084.—*Mr. Charles H. Hewer*, High Street, Cricklade, Wilts. "Track Clearer. Price 1*l.* 1*s.*—For attachment

to grass mowers. Made to work on any machine." Seeing that every mower is fitted at the outer end of the knife-board with guides for clearing the track which will be taken by the driving wheels on the next turn round the field, it is a remarkable thing that no one has hitherto thought of fitting a removable clearer to the inner end of the knife-board for clearing a track on which the machine might be driven in the opposite direction for cutting out the headlands. That is the object of this invention, which appears to be as practical as simple.

Article 3671.—*Messrs. S. M. Wilmot & Co., Albert Road, St. Philip's, Bristol.* "Improved Lamb Shelter. Various sizes and prices."—These shelters, primarily intended for use in the lambing season, will commend themselves for use for many other purposes. They are eminently strong, simple, and portable. Circular in form, they are constructed of galvanised steel corrugated sheets formed in four sections. These are readily bolted together in a few minutes. The roof is made of waterproof canvas, and is supported by a single pole in the centre, like an ordinary military bell tent.

Article 3893.—*Messrs. F. Parker & Co., 22 West End Lane, Kilburn, London, N.W.* "Collection of baskets." Price from 3s. each. These baskets are strengthened by the interweaving of a rod of wrought iron. The ends of the rod are welded together, and the loop thus formed passes through both handles and across the bottom of the basket, adding very greatly to the strength, but very little to the weight. They commend themselves for use in all cases where the breaking of a handle might involve danger to life or limb.

CONCLUSION.

On counting up the number of exhibits which the Judges have considered worthy of mention in the Journal this year, I find there is an increase of more than 50 per cent. in the total, and that, too, on a much smaller entry of "New Implements," a fact pointing to the superiority of the exhibits this year as mentioned at the beginning of this Report.

The thanks of the Judges are due to the Stewards of Implements, Mr. R. Neville Grenville, Mr. W. A. Prout, and Captain W. S. B. Levett, for their energetic organisation; and to Mr. F. S. Courtney, the Society's Consulting Engineer, for his ever-ready help and valuable experience.

J. BROUGHTON DUGDALE.

Wroxall Abbey, Warwick.

THE AGRICULTURAL EDUCATION EXHIBITION, 1904.

THE circumstances under which an Agricultural Education Exhibition was organised in connection with the Society's Show of 1903 were described in the last Volume of the Journal, pp. 171-173. Its interesting and instructive character was immediately apparent, and a large number of visitors testified to the public appreciation. In a new departure of this kind, there must necessarily be imperfections capable of being remedied as the result of experience ; so that it was not surprising to find that the Exhibition of 1904 was an improvement upon the previous year, and that all the departments were more completely represented. It was felt that collections which had involved so much thought, care, and skill, ought to have some special record in the Journal ; and, as Steward of the Exhibition, I readily undertook to compile some account of the principal scientific exhibits and of the practical agricultural lessons which they were designed to convey.

This year's Exhibition was organised by the Society's Education Committee, in conjunction with the various institutions represented by exhibits. The Agricultural Education Association—a body composed of agricultural education directors and teachers—also co-operated.

As a Forestry Exhibition was accommodated in the same building, the Education Exhibition was compressed within a smaller aggregate space than in 1903 ; but no great disadvantage resulted from this arrangement, although some of the Colleges would have been prepared to occupy more space if it had been available.

I proceed now to describe the principal exhibits in the order in which they were located within the building.

I. Rothamsted Experimental Station.—The Lawes Agricultural Trust showed, amongst other exhibits, a collection illustrating experiments on the quality of English wheat, which have been carried on at Rothamsted in conjunction with the Home Grown Wheat Committee of the National Association of Millers.¹ The exhibit comprised loaves of bread baked of flour from American spring and winter wheats, Canadian wheats grown in England, Australian, and various English wheats. These loaves were all baked under the same conditions and

¹ See also page 296 of this Volume.

contained approximately the same quantity of flour (if anything the larger loaves contained slightly less flour than the smaller ones). The term "strength" is used to indicate the capacity of a flour to make a loaf of large size and proper shape, not the amount of water a flour will take up. The loaves exhibited illustrated the great differences in strength between the various sorts of wheat. Thus, a loaf baked from the best Manitoba wheat, typically "strong" wheat, was of large size and attractive appearance; that from hard Kansas, the best American winter wheat, showed a falling off in size, which was still more marked in the case of the English wheats, these being, naturally, comparatively "weak"; and the reason for the difference in price between Manitoba and English wheats, which generally amounts to five or six shillings a quarter, was shown at once by the size of the loaves. Again, the large size of the loaves from Canadian seed wheat, grown for two years in England, showed that this quality of strength is not entirely dependent on climate or locality. The loaf from Australian wheat was only of medium size, showing that sunshine does not of itself produce high "strength."

II. Cambridge University Agricultural Department.—The exhibits included an important series of wheat hybrids, designed to illustrate the technical application of Mendel's Laws of Heredity. A Note on this subject appears elsewhere in this Volume of the Journal (see pp. 337-345). An exhibit of barleys consisted of about sixty little-known varieties of the chief sub-species of *Hordeum*, many of them showing characters which may prove of value if they can be introduced into our commonly cultivated strains.

An interesting exhibit of turfs from Abbotsley, in Huntingdonshire, illustrated the effects of different seed mixtures on the quality of pastures sown down in 1900. The soil was a stiff clay, and, naturally, difficult to lay down with grass. Eight mixtures were employed in the experiment, and the turfs sent illustrated four of the most instructive.

Mixture 1.—This seed mixture consisted of 42 lb. perennial rye grass and $5\frac{1}{4}$ lb. mixed red, alsike, and white clovers; 47 lb. of seed were sown at a cost of 14s. 6d. per acre. This cheap mixture has hitherto given good results, and the herbage now consists chiefly of perennial rye grass and white clover. The pasture is much liked by stock and is always eaten bare.

Mixture 2.—This consisted of 6 lb. perennial rye grass, 9 lb. meadow fescue, 2 lb. foxtail, 6 lb. cocksfoot, $3\frac{1}{2}$ lb.

timothy, and the same clovers as in Mixture 1; 32 lb. of seed were sown at a cost of 28s. 6d. per acre. For the first two years this plot was not any better than the last, but it gradually improved and is now slightly superior as a pasture. The herbage is not so well grazed as in the case of Mixture 1.

Mixture 3.—This consisted of 3 $\frac{3}{4}$ lb. cocksfoot, 2 $\frac{1}{4}$ lb. timothy, 6 lb. meadow fescue, 3 lb. hard fescue, 1 $\frac{1}{4}$ lb. foxtail, 2 $\frac{1}{2}$ lb. crested dogstail, 1 $\frac{1}{4}$ lb. rough-stalked meadow grass, and the same clovers as before; 25 $\frac{1}{2}$ lb. seed were sown, the cost being 30s. 6d. per acre. In this case there was no rye grass. The omission of the rye grass increased the cost of the mixture, and resulted in an inferior pasture. The ground is not so uniformly covered as in the other cases, and there is a greater quantity of rough grass.

Mixture 4.—This consisted of a seeding recommended by Mr. R. H. Elliot, of Clifton Park, Kelso.¹ The composition was 6 lb. cocksfoot, 2 lb. hard fescue, 5 lb. meadow fescue, 2 lb. tall fescue, $\frac{1}{2}$ lb. rough-stalked meadow grass, 2 lb. smooth-stalked meadow grass, 3 lb. tall oat grass, $\frac{1}{2}$ lb. yellow oat grass, 4 lb. Italian rye grass, 2 lb. cow grass, 2 lb. alsike clover, 2 lb. white clover, 2 $\frac{1}{2}$ lb. kidney vetch, 8 lb. burnet, 2 lb. chicory, 1 lb. sheep's parsley, 1 lb. yarrow. The total weight of seed was 45 $\frac{1}{2}$ lb., and the cost 39s. 6d. per acre. The pasture is now much the best of the series. It is closely covered, healthy, strong growing, and is much liked by the stock. Its chief characteristic is the relative abundance of white clover.

A set of turfs from Wenden Lofts, in Essex, was shown for the purpose of explaining the action of basic slag. The beneficial action of basic slag on most heavy clay soils is well known, and the reason for this benefit is to be found in the effect which slag produces upon white clover. In the absence of clovers slag is of no value to pastures on heavy land. The Wenden Lofts soil in its natural state is devoid of clover and grows only weeds and some of the poorest grasses. In the winter of 1902-1903 it was liberally dressed with (1) basic slag; (2) basic slag, potash, and lime in combination; but the manures did not produce the least effect. A portion of the land was sown with white clover seed in February at the rate of 12 lb. per acre. The intention was to harrow the seed in, but the soil was so hard that no impression of any sort could be made upon it, and the seed was left on the surface. In spite of

¹ See article in Journal R.A.S.E., Vol. 58, 1897, pp. 467-477.

the manner of sowing, a fairly even plant of white clover was secured, but the crop was very poor and made hardly any growth in the summer of 1904. When clover was sown on a part of the soil which had received basic slag, however, it developed in the most luxuriant fashion, just as it does on soils naturally suited to the action of slag. The turfs comprising the exhibit showed—(1) untreated soil; (2) land on which clover had been sown; (3) land to which manures had been applied; and (4) manured land on which clover had been sown. There was no striking result except in the case of the turf representing land which had received both seed and the manure. This gave very clear evidence that two things are necessary for the improvement of poor clay pastures—(1) a phosphatic manure, (2) a clover plant.

The chemical composition of root crops was explained by a number of diagrams showing the percentage of dry matter and sugar in mangels, swedes, and common turnips grown in 1903, and the variation of these constituents due to individuality, variety, soil, and season. In the case of the mangel the percentage of nitrogen (proteid and amide) in 100 individual roots of the same variety was shown, in addition to their dry matter and sugar contents. The object of the experiments was to select roots for reproduction having the highest percentage of dry matter, and the results show how great is the variation in individual roots of the same kind grown under similar conditions, and also that soil and climate have a great effect in varying the composition of roots of the same kind.

A set of mangel diagrams showed—(1) Percentages of dry matter and sugar in nine varieties grown on different soils at three stations in Norfolk, and one each in Cambridgeshire and Bedford. Taking the average percentage of dry matter and sugar in the nine varieties, the highest was 13·2 per cent. dry matter, and 9·3 per cent. sugar, grown on a medium soil in Cambridge, while the lowest was 10·2 per cent. dry matter, and 6·4 per cent. sugar, grown on a light loam in Norfolk. At no two stations was any one variety the best, but the yellow globe invariably came out the lowest in dry matter and sugar at the five stations. (2) Variation in dry matter, sugar, nitrogen (proteid and amide), in 100 individual roots of Sutton's Golden Globe. It was shown that there was an enormous variation in the amount of dry matter and sugar present in different mangels of the same variety. The highest percentage of dry matter found was 15·5, and the lowest 8·7 ;

highest sugar 11·0, and lowest 5·8. The nitrogen varied to an even greater extent. No definite relationship could be found between the amounts of the different constituents present in a root; each varied independently of the rest. It was thus possible to have a high sugar and nitrogen content in the same root or vice versâ.

A set of swede diagrams showed the percentage of dry matter and sugar in seven varieties of swedes grown at seven different stations, three in the eastern counties, and four in Scotland. It was shown that the effect of locality on the composition of the swede was not so great as on the mangel. Taking the average of the seven varieties, the highest in dry matter was 12 per cent., and in sugar 8 per cent., grown on a light sandy loam in Norfolk; and the lowest in dry matter was 10·4 per cent., and sugar 6 per cent., grown on a light loam in Norfolk.

A common turnip diagram showed the percentage of dry matter and sugar in seven varieties of turnip grown at two stations. Here the difference in composition between varieties is much less than in mangels or swedes.

III. Essex County Council Technical Laboratories.—Diagrams and turfs from experimental plots in Essex illustrated the value of phosphatic manures in increasing the quantity, and improving the quality of the herbage on the derelict grass land in Essex. The experiments demonstrated that nitrogenous manures in the absence of phosphates were of little value. Basic slag had proved to be the best manure. Other turfs illustrated the use of sulphate of ammonia as a weed killer. A small pinch of this placed on each plantain found growing in a lawn killed the plantain without injuring the grass; daisies may also be destroyed in the same way. Specimens of red clover showed how clover sickness is capable of being cured by the application of lime; the beneficial effect of this alkali was such that three crops of clover had been grown in two years on land previously "clover sick"; with basic slag and kainit similar results had been obtained, enabling clover to be successfully grown twice in three years.

Other exhibits illustrated a comparison which has been instituted between Scotch potato soil and the soil of Essex. The two soils were found to be very similar as regards potash, which is essential to the successful cultivation of the potato; but the Scotch soil contained more lime, phosphoric matter, organic matter, and nitrogen than the Essex soil. The

practical outcome of this comparison is that the Essex soil requires more manure, but that it is unnecessary to add potash.

In the department of Dairy Bacteriology cultivations were exhibited showing the sources of bacterial contamination in milk, such as from the air, from milkers' hands, from the cow's udder, and from dirty milk pails. The action of these bacteria in curdling and acidifying milk was illustrated, some dissolving the curd, some causing colouration, and some imparting an unpleasant flavour. These exhibits indicated the necessity for absolute cleanliness in dairying operations.

IV. South Eastern Agricultural College.—The exhibits of this College were divided into three departments: Economic Zoology, Economic Botany, and Chemistry. The Zoological Section included a large collection of injurious and useful insects, some of the more common or typical pests being shown as living specimens actually at work. A new bee pest—a fly, *Plyphus fenestratis*—that has been damaging the honeycomb during the past year, and specimens of spoiled comb, were also shown. Ladybirds and other beneficial insects were shown, the former including specimens of kinds that have recently been introduced into this country as a means of checking aphids and scale. The Botanical Section included numerous specimens of diseased plants, with particulars of the diseases, mounted specimens of young grafted fruit trees and collections of agricultural seeds and their adulterants; also models of various systems of hop training. The exhibits from the Chemical Department were connected with the soil survey of Kent and Surrey, and the general effect of adulterants on manures, washes, foods, &c. The soil survey has now been going on for nearly five years. The soil is resolved by appropriate means into its ultimate particles, and it has been found that the properties of a soil depend in a remarkable way on the size of these particles. Thus, the adaptability of a soil to early fruit crops can be more or less predicted from a knowledge of its mechanical constitution.

V. Midland Agricultural and Dairy Institute.—Specimens were exhibited of potato plants in pots, consisting of new varieties obtained by cross-pollination. The Institute also showed some interesting diagrams bearing upon the milk standard question, based upon analyses of samples of milk taken every week during 1903 from each cow of the Institute herd, both at night and in the morning. The most important results were as follows:—

(1) That even in a mixed herd the percentage of fat in the morning's milk may average less than the standard of three per cent. for a whole week.

(2) The milk of individual cows is subject to greater variations in quality, and may often be below the standard.

(3) That with the ordinary times of milking, the night's milk is generally richer in fat than the morning's, the quantity of milk being greater in the morning.

(4) There were many exceptions to this, and in the case of one herd the morning's milk was richer than the night's for months together, although the night interval was longer than the day.

A number of cases illustrative of recent advances in Dairy Bacteriology were exhibited. One showed by means of cultures in milk the newly discovered associative action of bacteria in souring milk; acid and alkali-producing organisms growing together were shown to produce acid more quickly than where the acid-producing organism grows alone. Cases of cultures showed the mode of growth of the "Lange Wei" organisms used for ripening Edam cheese: the organisms concerned in the manufacture of Camembert cheese; the lactic ferments in use at the Midland Agricultural and Dairy Institute. Other cases showed by means of plate cultures on gelatine the sources of the lactic ferments. The greatest source of infection proved to be the use of badly cleaned milking pails, and the importance of cleanliness in all departments was further demonstrated by this means.

VI. Harper-Adams Agricultural College.—The principal exhibit had reference to seed testing and included a variety of apparatus for germinating, sifting, &c., all specially made at the College. Collections of flowering specimens and seedlings of common weeds and poisonous plants were also an interesting feature. The plants thus illustrated were thistles, docks, woody and deadly nightshade, meadow saffron, darnel, spurry, ribgrass, corncockle, &c. The germinating power of white and red clover and timothy was illustrated by a series of photographs, and the germinating capacity of samples of Chilian, English, French, Canadian, and German red clover was also shown by a diagram.

VII. & VIII. University Colleges of Reading and Wales.—These two Colleges both exhibited samples of soils, the former from the county of Dorset and the latter from various counties in Wales. They formed one of the most interesting sections of the Exhibition, but they do not readily lend themselves to brief description. Detailed particulars of the exhibits were printed in the catalogue of the Show, pp. 261-264.

IX. Agricultural Education Association.—This section was a depôt for the distribution of the Reports and other publications

of the various agricultural colleges. It served a useful purpose by enabling visitors to procure at once all the college literature available upon any of the subjects illustrated in the Exhibition.

X. Royal Agricultural Society of England.—There remains for description the share in this Exhibition taken by the Society itself. The Society's various publications were on view, and its Botanical and Zoological Departments sent useful exhibits.

Mr. William Carruthers, F.R.S., the Society's Consulting Botanist, had collected a set of the weed seeds generally found in grass and clover seeds. These were arranged in eleven cases, the first eight of which comprised the weed seeds which occur in British specimens of grasses and clovers, the ninth and tenth were American weeds, and the eleventh Continental weeds.

Mr. Cecil Warburton, M.A., the Society's Zoologist, exhibited three cases showing specimens of injurious insects, and examples of the injuries done by each.

From the Woburn Experimental Station, which is under the direction of the Society's Consulting Chemist (Dr. J. Augustus Voelcker, M.A., F.I.C.), came plans of the experimental fields, setting out the present cropping, and diagrams showing the average yields of the principal experimental crops over a period of twenty years. The main portion of the exhibit consisted, however, of contributions from the Pot-culture Station, which formed a continual source of interest throughout the Show. The point of chief interest was the demonstration of the exhaustion of land, naturally poor in lime, by the continued use of nitrogenous top-dressings, which produced a state of acidity and unhealthiness in the soil, and caused removal of lime, &c., in the drainage water; also the remarkable restoration of the cropping power of the soil by the single application of 2 tons of lime to the acre, the effects of which have not been exhausted though seven years have since elapsed. The growth of barley on this soil, with and without lime, at the present time, was illustrated by specimens in pots, the crop, where lime was absent, consisting of a few starved stalks of barley with a luxuriant mass of spurry—a weed that thrives on sour land—whereas where lime was applied this weed was absent, and the barley was doing well. The effect on the roots of the barley and wheat plants was also illustrated.

Of greatest interest, perhaps, as being the outcome of most recent inquiry, was the exhibit of the mechanical effect produced

in soil by the continuous application of rain-water as compared with solutions of nitrate of soda, ammonium sulphate, and ammonium chloride. Not only was it shown that the salts named removed the lime from the soil in varying but always larger proportions than did rain-water, but the mechanical differences produced in the condition of the soil were of a most striking nature. Whereas with rain-water the soil—a light sandy loam—retained its fine state of division throughout an entire depth of two feet, where the salts were used a massing together of the soil particles was produced, resulting in the formation of lumps, the surface presenting also a crusted and cracked appearance. This resulted in the more rapid loss of moisture and the washing down to the lower layers of the finer particles of the soil, so that the soil, deprived as it was simultaneously of its organic matter, required more water to be applied, and became clogged and in an unsatisfactory condition. This was so marked in the case of nitrate of soda that, after a depth of one foot or so had been passed, the fine soil was found to be washed down to the bottom, and formed there a cemented lump through which no drainage would pass. This is the explanation of what takes place when soil “runs together,” as it is termed, through the use of nitrate of soda.

Following on the demonstration of the valuable influence of lime on an arable crop, was an equally marked one of its utility on grass land when lime is deficient in the soil. This consisted of a block of turf about a foot square which was cut out of one of the fields on which for the past eight years the Society has been carrying out experiments with a view to the improvement of poor grass land.¹ The geological formation of this field, which is in Yorkshire, is the Coal Measures, and the soil is a grey clay of heavy character. When the experiment began in 1896, Dr. Voelcker, after analysis of the soil, advised that lime would be useful, and this was abundantly justified. For some years past cake had been fed extensively on this land, but with little effect. The turf originally was a mass of coarse grass, principally *agrostis*, with hardly a bit of clover, and, on cutting down into the soil, a spongy mass of decaying root fibre was found, this giving a distinctly acid reaction to test paper. In the year 1896 the field was divided into several plots, on one of which lime, at the rate of four tons per acre, was applied, and on the next one 6 cwt. per acre of basic slag and 2 cwt. of kainit. For the first two years the benefit from

¹ See Final Report on these Experiments in this Volume, pp. 316-336.

the lime was not very great, but after that time a change set in, and in 1898 Mr. Carruthers and Dr. Voelcker pointed out that the benefit from the lime was very marked. From that time on, the action of the lime has produced continued improvement; the coarse grass has given way to fine herbage with abundant clover; and the cattle were always to be found on that part of the field. The specimen exhibited was taken just on the dividing line of the lime and basic slag plots, and showed most clearly how the lime had told almost to an inch wherever it was applied. Not only was the difference observable in the herbage, but also in the root growth below; for, whereas on the unlimed part there remained a spongy mass of decaying roots with but little penetration of roots into the soil below, on the limed portion this had given place entirely to good soil with roots freely penetrating into it. No doubt the treading of the cattle, consequent on their feeding better on the sweetened pasture, aided greatly in bringing about this change. The soil, it should be mentioned, is one on which basic slag is not known to answer.

The results of treating "smutty" wheat by the hot water (Jensen) method were shown, and the produce from such after-treatment was found to be quite free from smut.

Lastly, there were several exhibits of growing plants of Barley, showing the influence, favourable or otherwise, of the application of minute quantities of the rarer salts, such as lithium chloride, sodium iodide, and manganese carbonate, these being the outcome of experiments under the Hills Bequest.

The whole exhibit was under the charge of Dr. Voelcker's assistant, Mr. H. M. Freear, whose ready and clear explanations added greatly to the interest of the section.

The foregoing account is by no means exhaustive. In fact, probably the majority of the exhibits could only be properly appreciated by personal inspection. My main object has been to indicate some of the practical lessons, derivable from the Exhibition. I desire cordially to acknowledge the assistance given by the expert representatives of the different colleges and institutions in personally explaining the exhibits to visitors. Such explanations added greatly to their interest and value.

J. BOWEN-JONES.

St. Mary's Court, Shrewsbury.

Official Reports.

REPORT OF THE COUNCIL

TO THE

SIXTY-FIFTH ANNIVERSARY GENERAL MEETING OF
GOVERNORS AND MEMBERS OF THE SOCIETY,

HELD AT THE SOCIETY'S HOUSE,

ON MONDAY, MAY 30, 1904, AT 12 NOON.

(ADJOURNED FROM WHIT-MONDAY, MAY 23, 1904.)

THE EARL OF DERBY, K.G.

(President) in the Chair.

1. The Council have to report the following changes in the list of Governors and Members during the year which has elapsed since the last Anniversary Meeting in May, 1903 :— 9 Governors, 7 Honorary Members, and 620 Members have been admitted into the Society, and 12 Members have been reinstated under Bye-law 12; whilst the deaths of 6 Governors, 2 Honorary Members, 88 Life Members, and 114 Annual Members have been reported. A total of 314 Members have resigned; whilst 25 have been struck off the books under Bye-law 10, owing to absence of addresses, and 20 under Bye-law 11, for arrears of subscriptions.

2. Amongst the Governors and Members of the Society whose deaths have been announced since the last meeting in December are H.R.H. the Duke of Cambridge, K.G. (a Governor since 1862), the Marquis of Sligo, the Earl of Ravensworth, the Earl of Strathmore, Lord Alington, Lord Malcolm of Poltalloch, Lord Henry Thynne, Sir Hugh Cholmeley, Bart., Sir Thomas Salt, Bart., Sir M. R. Shaw Stewart, Bart., Sir Harry Bullard, M.P., Sir Edward Walter, Mr. Alfred Crosskill (a Member since 1856), Mr. John Dugdale, Captain Harry Heaton, of Worsley, Manchester, Count Arthur Moore, of Mooresfort, Tipperary, Mr. James Banks Stanhope, of Revesby Abbey, Boston (a Member since 1842), and Mr. Edmund Turnor, of Pantan Hall, Wragby.

3. The total number of Governors and Members now on the Register is 9,477 (as against 9,398 in May, 1903), divided as follows :—

- 3 Foundation Life Governors (Members elected before the granting of the Charter on March 26, 1840), viz. : Professor J. Beart Simonds, Mr. W. Barrow Simonds, and Mr. J. P. Fletcher ;
- 68 Governors paying an annual subscription of 5*l.* ;
- 93 Life Governors ;
- 5,906 Members paying an annual subscription of 1*l.* ;
- 3,264 Life Members ;
- 111 Life Members by Examination ;
- 32 Honorary Members ;

9,477 Total number of Governors and Members.

4. Mr. Hermanus Johannus Lovink, Director-General of Agriculture at The Hague, has been elected as an Honorary Member of the Society in the room of the late Dr. C. J. Sickesz van de Cloese, of The Hague, whose death the Council record with regret.

5. The Balance-sheet for the year 1903 has been duly examined and certified as correct by the Auditors appointed by the Members, and by Messrs. Welton, Jones & Co., the professional Accountants employed by the Society ; and it is printed as an Appendix to this Report [see pp. xii and xiii], together with a letter from the Society's Accountants [see page xvi], explanatory of the new form of presenting the year's accounts which they have advised the Council to adopt. A Sub-committee has for some time been engaged in considering the present expenditure of the Society, and has presented to the Council a Report making various recommendations which have been referred to the several spending Committees concerned, and from the adoption of which it is expected that substantial economies will result.

6. The question of the present mode of procedure for the election of Members of Council has been carefully considered by the Council, who are advised that the terms of the Society's Charter preclude the adoption of any other system than that now in force, viz., the election of those Governors and Members present at the Anniversary Meeting held in May, of 25 Ordinary Members of Council in the room of those who retire by rotation. As it appeared that Members were not sufficiently aware of the powers of nomination and election which they at present possess under the Charter and Bye-laws, the Council issued to all the Members in March last a circular-letter of explanation and a list of the attendances at Council and Committee meetings

during the past two years of the 23 retiring Members of Council, together with an invitation to suggest the names and addresses of Members recommended by them as suitable to serve on the Council. In response to this letter the following nominations have been received under Section c of By-law 23 :—

- ADAMS, George. Wadley House, Faringdon, Berks.
Proposed by *Professor Edward Blundell*,
Seconded by *Mr. Henry Reece Cooper*.
- GREENALL, Sir Gilbert, Bart. Walton Hall, Warrington, Lancashire.
Proposed by *Mr. Christopher W. Wilson*,
Seconded by *Sir John H. Thorold, Bart.*
- KNOWLES, Robert Millington. Colston Bassett Hall, near Bingham, Nottinghamshire.
Proposed by *Mr. Henry Smith, jun.*,
Seconded by *Mr. John Parr*.
- KNOX, Edward. Hylton Estates Office, Kilmersdon, Bath, Somerset.
Proposed by the *Earl of Jersey*,
Seconded by *Lord Tredegar*.
- MIDDLETON, Christopher. Vane Terrace, Darlington, Co. Durham.
Proposed by *Sir Jacob Wilson*,
Seconded by *Mr. J. Bowen-Jones*.
- MONTEFIORE, The Rev. D. B. Mursley Hall, Winslow, Buckinghamshire.
Proposed by *Mr. G. Norris Midwood*,
Seconded by *Mr. Edward Mucklow, jun.*
- PALMER, Ralph. Nazeing Park, Essex.
Proposed by *Mr. Leonard A. Routledge*,
Seconded by *Mr. Daniel T. Hine*.
- POTTER, Thomas. Daybrook House, Nottingham.
Proposed by the *Right Hon. F. J. Savile Foljambe*,
Seconded by *Mr. George H. Sanday*.
- TURNER, Arthur Philip. The Leen, Pembridge, Herefordshire.
Proposed by *Mr. George Buttars*,
Seconded by *Mr. Allen E. Hughes*.

7. In view of the issue to Members of the circular-letter referred to in the preceding paragraph, the Council postponed filling up until the Anniversary General Meeting the two vacancies on the Council caused by the regretted death of the second Earl of Ravensworth, who had represented Durham on the Council since the year 1867, and by the resignation in December last of Mr. Henry Smith, of Cropwell Butler, who had represented Nottinghamshire since 1889. Two further vacancies will be created by the ineligibility for re-election of two Members of Council who retire on this occasion, but have not been able to give during the last two years the number of attendances at Council Meetings required by By-law 23b. It will, therefore, be the duty of the Governors and Members present at the Anniversary Meeting to select 25 Members to serve on the Council from the 30 candidates for the position, viz., the 21 retiring but eligible Members of Council, and the 9 new candidates mentioned above.

8. Good progress is being made with the preparations for the Society's Sixty-fifth Annual Exhibition, which will be held at Park Royal, Willesden, London, N.W., from June 21 to 25 next. The total value of the prizes offered for competition is 6,081*l.*, of which 1,165*l.* have been generously contributed by Breed Societies. The prizes are thus distributed between the different sections of the Show: Horses, 1,471*l.*; Cattle, 1,973*l.*; Sheep, 1,430*l.*; Pigs, 391*l.*; Poultry, 225*l.*; Butter, 41*l.*; Cheese, 78*l.*; Cider and Perry, 40*l.*; Corn, 42*l.*; Wool, 48*l.*; Hops, 48*l.*; Hives and Honey, 53*l.*; Horse-jumping, 173*l.*; Horse-shoeing, 32*l.*; Butter-making, 36*l.* Prizes, towards which the Polo and Riding Pony Society have generously made a grant of 25*l.*, will also be given for Bending and other Competitions for Polo Ponies on the last two days of the Show, and a Military Display will be given on the afternoon of Saturday, June 25. A statement as to the number of entries of Live Stock, Poultry and Produce, which do not close until May 16, will be laid before the Members at the Meeting on the 30th instant. In the Implement Department, the number of feet of shedding (exclusive of open ground space), actually allotted, is 11,722 ft., as compared with 14,585 ft. last year and with 13,656 ft., the average of the eight previous Shows. The total number of Implement Stands is 350, and 67 entries have been received for the Society's Silver Medals offered for "New Implements."

9. Numerous exhibits have been promised by individual Governors and Members of the Society for the purposes of the proposed British Forestry Exhibition to be held in connection with the Show at Park Royal. It is believed that this Exhibition will prove valuable to owners of woodlands and to foresters, as well as interesting to the public generally. An Agricultural Education Exhibition will again be organised by the Society in co-operation with the Lawes Agricultural Trust and some of the principal Agricultural and University Colleges. The work carried on at the Society's Woburn Experimental and Pot-culture Station will be illustrated by exhibits and explained personally; and there will be a depôt for the sale of the Society's publications. These will include reprints of the articles on Forestry from the last Volume of the Journal and two new pamphlets on Fruit and Vegetable Farming.

10. The opening day of the Show, Tuesday, June 21, when the charge for the admission of the general public will be 5*s.* each person, will be devoted to the judging of the live stock, poultry, and produce. On Wednesday, June 22, and Thursday, June 23, the charge for admission of the public will be 2*s.* 6*d.* (after 4 p.m. 1*s.*), and on Friday and Saturday, June 24 and 25, the charge for admission will be 1*s.*

Full details of the daily arrangements will appear in the Programme, which will be sent to each Member with his Admission Ticket before the middle of June. Arrangements have been made for the holding of Auction Sales of Horses, Cattle, Sheep and Pigs during the Show, and the sales have been fixed for Thursday, June 23.

11. A considerable falling off has been experienced in the number of samples sent to the Society's Laboratory for analysis during the past five months, the total being 240 as against 381 in 1903 over a similar period. At the same time, several cases have been brought to light showing the need of continued vigilance in regard to the examination of fertilisers and feeding stuffs used on the farm, and it is to be regretted that the Members of the Society do not more generally make use of the safeguards provided by reference to the Chemical Department.

12. Feeding experiments were carried out during the winter at the Woburn Experimental Farm. Those with bullocks were upon the relative efficiency of linseed cake high in oil and of linseed cake low in oil; while the experiments with sheep turned upon the respective values of Egyptian and of Bombay cotton cake. In the Field Experiments, further trials with Canadian varieties of wheat have been begun. The Hills Experiments have been advanced a further stage at the Pot-culture Station, the influence of manganese salts being the subject of present investigation. Other points relating to sourness of land and to the influence of green-manuring are also being dealt with.

13. Since the beginning of the year, 156 inquiries have been dealt with in the Botanical Department. Considerable difficulty has been experienced in obtaining seed of red clover free from dodder. A large proportion of this seed has had to be imported, and is being sold without being efficiently cleaned. Several injuries to plants have been investigated, the more serious being an attack on lime trees in Hampshire by a parasitic fungus, and the appearance of an obscure fungus disease on potato tubers in Yorkshire.

14. The applications received by the Zoologist during the winter referred for the most part to insects infesting stored grain and other products, while in other cases advice was asked in anticipation of the attack of fruit-tree and various other pests. The disease of "big-bud" in black currants has been a frequent subject of inquiry, but no Member of the Society has recently asked for an inspection of his plants in the belief that they are free from the mite, and further information as to areas where the pest has not yet penetrated is greatly needed. Since the commencement of

spring no insect attack of general interest has been reported, though complaints have been received from various quarters of such familiar pests as wireworm and millepede.

15. Since the beginning of the year, some slight progress appears to have been made in the direction of exterminating swine-fever, but the returns with regard to anthrax and glanders indicate that these diseases are now more prevalent than they have been for many years. No case of rabies has been detected during the last half year, and as nearly eighteen months have elapsed since the last reported case it may with much confidence be assumed that the disease has actually been stamped out.

16. The Fifth Annual Examination for the National Diploma in Agriculture was, by the courtesy of the authorities of the Yorkshire College at Leeds, held in the College in the week commencing the 9th instant. The examination for this Diploma is conducted by a joint Board, composed of representatives of the Highland and Agricultural Society of Scotland and of this Society. The number of candidates was 75, of whom 47 entered in Part I. and 28 in Part II. The results of the Examination will be announced to the Members at the General Meeting.

17. The Annual Examinations in the autumn for the National Diploma in the Science and Practice of Dairying will be held, as before, at the Reading College and British Dairy Institute (for English candidates), from September 19 to 22 next, and at the Scottish Dairy Institute, Kilmarnock (for Scottish candidates), from September 26 to 29. The entries for both these Examinations will close on Wednesday, August 31, 1904.

By Order of the Council,

ERNEST CLARKE,

Secretary.

13 Hanover Square, London, W.

REPORT OF THE COUNCIL

TO THE

HALF-YEARLY GENERAL MEETING OF GOVERNORS
AND MEMBERS OF THE SOCIETY,

HELD AT 20 HANOVER SQUARE, W.,

ON THURSDAY, DECEMBER 8, 1904, AT 11 A.M.

LORD MIDDLETON (President) in the Chair.

1. The Council have to report that the list of Governors and Members has undergone the following changes during the half year which has elapsed since the Anniversary General Meeting in May last : 2 new Governors and 278 new Members have joined the Society, and 10 Members have been reinstated under Bye-law 12 ; whilst the deaths of 4 Governors, 48 Life Members, and 79 Annual Members have been reported. A total of 10 Members have been struck off the books under Bye-law 10, owing to absence of addresses ; 50 under Bye-law 11, for arrears of subscription ; and 12 Life Members and 277 Annual Members have resigned.

2. The Council regret to have to record the deaths, since the Anniversary General Meeting in May last, of no less than three of their number : Viscount Bridport, G.C.B. (died June 4), Mr. J. P. Terry (died July 24), and Viscount Ridley (died November 28). Lord Bridport, who was at the time of his death Senior Trustee of the Society, joined it as a Member so long ago as 1842. He became a Member of the Council in 1858, a Trustee in 1871, and was President in 1875. In his day he took an active part in the work of the Society, and served upon some of its more important Committees, including the Finance Committee, of which he was a Member from 1859 to 1902, and Chairman from 1861 to 1875. Lord Ridley had been a Member of the Society since 1869, and was elected a Member of the Council at the Anniversary General Meeting of that year. He was appointed a Vice-President in 1886, and a Trustee in 1889 ; and he was President of the Society in 1888, when the Show was held at Nottingham. Mr. Terry had been a Member of the Council since 1890, and had rendered valuable practical assistance in the management of the Woburn Experimental Farm.

3. The death has also to be recorded of Professor James Beart Simonds, Senior Consulting Veterinary Surgeon, a Foundation Life Governor and an Honorary Member since

1849. More than sixty years ago Professor Simonds was acting as Veterinary Inspector at the Society's earliest Shows. He rendered eminent services to the Veterinary Profession by his scientific researches, and as Principal of the Royal Veterinary College. The Society is greatly indebted to him for his valuable treatises in the Journal on the anatomy, physiology, and pathology of farm animals, and for his efforts to combat the disastrous outbreak of cattle plague in 1865. The Council also announce with regret the death on October 17 of Mr. Wilson Bennison, who rendered valuable services as Surveyor and Superintendent of the Showyard from 1880 to 1896.

4. Amongst other Governors and Members whose loss by death since the last General Meeting the Society has to deplore are : The Earl of Northbrook, Viscount Powerscourt, Lord Harlech, Lord Hastings, Sir William Harcourt, M.P., The Right Hon. James Lowther, M.P., Sir John Croft, Bart., Sir Uthred J. Hay Dunbar, Bart., Mr. Justice Wright, the Rev. C. Wolley-Dod, of Edge Hall, Malpas, Mr. W. H. Hall, of Six Mile Bottom, Cambridge, Mr. William Lipscomb, of Heath, Wakefield, Mr. John Parnell, of Rugby, Dr. George Vivian Poore, M.D., Mr. Walter Shoolbred, Mr. William Waring (a Member since 1848), and Mr. Alfred Wrinch, of Hill Crest, Ipswich.

5. The above and other changes bring the total number of Governors and Members now on the Register to 9,290 divided as follows :—

2 Foundation Life Governors (Members elected before the granting of the Charter on March 26, 1840), viz. :
Mr. W. Barrow Simonds and Mr. J. P. Fletcher ;

69 Annual Governors ;

91 Life Governors ;

5,771 Annual Members ;

3,216 Life Members ;

110 Life Members by examination ;

31 Honorary Members.

9,290 Total number of Governors and Members, as against a total of 9,477 Members on the Register on May 1, 1904, as reported to the Anniversary General Meeting on May 30 last.

6. To fill the vacancies caused by the deaths of Lord Bridport and Mr. Terry, Lord Middleton has been elected a Trustee, and Mr. Ernest Mathews, of Little Shardeloes, Amersham, Bucks, and Mr. A. P. Turner, of The Leen, Penbridge, Herefordshire, have been elected Members of the Council.

7. Having regard to the frequently expressed desire for an alteration in the system of appointing the governing body (as to which the Council reported on May 30, 1904, that the existing

Charter of 1840 precluded the adoption of any other procedure than that now in force), a special Committee was appointed on October 6 last, with instructions to take the necessary steps to obtain such an alteration in the Charter as would enable the Society to re-arrange its system of appointing the Council, with a view to its being placed on a more representative basis. Counsel having advised that this could be best effected by a Supplemental Charter, a Petition is being drawn up to include the following points : (1) That the Members in any district or group of counties should have the absolute power of electing their own representatives on the Council ; (2) that there should be a power of co-optation to the Council to the extent of, say, ten Members, so as to ensure representation of any particular branch or industry, scientific men or specialists ; and (3) that not less than one General Meeting of Members be held in the year, the date and place to be fixed by the Council. The steps necessary for obtaining the Supplemental Charter are being pushed forward as rapidly as possible, and it will be for the Council elected under this Charter to deliberate and decide as to the future of the Society's Shows and as to the character and scope of the Society's other operations. Meanwhile, the present Council have used and are using their utmost endeavours to carry out the Society's work with due economy, having regard to the financial position and without prejudice to the decisions which the Council elected under the new Charter will be called upon to make.

8. The Society's Sixty-fifth Annual Show was held at Park Royal from June 21 to 25 last. With but few exceptions in particular classes, a complete representation of British Agriculture and Live Stock was secured, and the Show was visited by a large number of the Governors and Members with their friends. In this connection the Council desire cordially to acknowledge the action of the Railway Companies in granting return tickets at the price of a single fare and a quarter to Members travelling to the Show from distances of over thirty miles. This valuable concession was greatly appreciated, and undoubtedly contributed to the large attendance of Members. For the financial success of its Shows the Society has had of course always to depend upon the attendance of the general public. In 1903, the total number of paying visitors was only 65,013, and the result was a financial loss of 9,681*l*. The circumstances of that year were, however, so exceptional that it was determined to hold another Show at Park Royal, and to put forth every effort to attract the attendance of visitors from the dense populations in and around the Metropolis. The result was, however, even more disappointing than the previous year. Notwithstanding the fact that the weather, both before

and during the Show, was brilliantly fine, only 52,930 persons paid for admission, and the Show has resulted in a further loss to the Society's funds of 6,920*l.* 9*s.* 10*d.*, as shown in the audited Statement of Receipts and Expenditure at the Show appended to this Report [see pp. xx-xxiii].

9. These two heavy losses, added to those on the provincial Shows of 1898, 1899, 1900, and 1902, have entirely exhausted the Society's Reserve Fund, and has brought it face to face with a most serious situation. The problem that presents itself is of no ordinary difficulty, viz., to provide for the continuance of the Annual Show and the maintenance in their leading features of those other departments which, not less than the Show, have been connected with the progress of agriculture since the foundation of the Society. As it is evident that the Society cannot rely upon an attendance next year at Park Royal sufficient to recoup the certain and unavoidable expenses, the Council convened on October 5 conferences with the exhibitors of Implements and Live Stock, with a view of ascertaining what measure of financial support was likely to be forthcoming if the Show were held in 1905 at Park Royal. With the results of these Conferences before them, and having regard to the importance of maintaining, if possible, the continuity of the Show, the Council determined to appeal to the general body of Governors and Members, to Exhibitors, and others interested, for funds to enable the Society to organise a Show next year without incurring a loss which it would have no means of meeting. This appeal was issued on October 18, and so far has resulted in the receipt of 484 promises of subscriptions to the Fund to enable the Show of 1905 to be held, which amount in all to 4,643*l.* In addition, 107 further promises of subscriptions and guarantees have been given, under conditions of various kinds made by the subscribers themselves, that amount in all to 665*l.* The Council have had under their anxious consideration at two meetings, held on November 2 and the 7th instant, the results of the appeal, and on the latter occasion they resolved, *nem. dis.* :—

“That a final decision as to the Show in 1905 be postponed until a meeting of the Council to be held in the second week in January, 1905, in the hope that further sums by way of subscriptions or guarantees will meanwhile be forthcoming from Members, Exhibitors, and others, which in the opinion of the Council will be sufficient to warrant the Society in organising a Show for 1905 without further loss to its general funds.”

10. The other aspects of the Society's present financial position have also received the anxious consideration of the Council. It will have been apparent to the Members from the

Balance-sheet for 1903, submitted at the Anniversary General Meeting held last May, that the Society had to commence its operations for the current year without any free assets which would be immediately available for realisation in the event of the Society's operations for 1904 resulting in a loss, as has unfortunately proved to be the case. Now that the Reserve Fund has been exhausted, the sum of 6,000*l.* from Annual Subscriptions is all the Income that can be relied upon at present to meet the cost of administering the Society and providing the whole body of Members (including 3,500 Life Members) with their privileges. The total expenses of the Society, other than those directly connected with the holding of the Annual Show, but including the cost of organising at Hanover Square the preliminaries of the Show (only a part of which has heretofore been debited to the Show Account), were, in 1903, 10,200*l.*, of which 9,055*l.* appeared in the "Ordinary" Income and Expenditure Account and 1,149*l.* in the Show Account. It is important in the best interests of the Society that the several departments of its public work should be continued, so far as funds will permit. The Council see their way to effect various economies by reductions of the salaries of the higher officials, savings in clerkage, &c., a diminution of the Journal, re-arrangements in the Chemical and Veterinary Departments, and letting off part of Harewood House, which will bring down the head office expenses in the future by a sum which, when all the new arrangements have been completed and if the Society's debts can be paid off, will be about 2,200*l.* a year, thus reducing the total cost to 8,000*l.* a year. The adjustment of the total cost as thus reduced, which seems to the Council, after careful consideration, to be fair as between the General Account and the Show Account, is 6,000*l.* to the former (including the Journal and all the scientific departments) and 2,000*l.* to the latter. Thus, though the Society might in the future be able to carry on all its departments of public work other than the Shows out of the income which it at present receives, it could not with such an income organise a Show, nor could it, having no longer a Reserve Fund of its own, or the considerable financial assistance which it used to receive from the localities formerly visited, bear the money loss which the holding of a Show must now almost certainly entail from the probable receipts falling short of the necessary expenditure.

11. The financial position of the Society at the end of this year will be as follows: In order to pay for the losses on the 1904 Show and the current obligations up to the end of this year, the Council have (1) arranged with the Society's Bankers to continue until July 31, 1905, the loan of 12,000*l.* granted by it in 1903 on security of the Harewood House Debenture

Stock held by the Society; (2) obtained from the Bank a further temporary loan, under the guarantee of certain of the Trustees, amounting now to 3,000*l.*; (3) borrowed a further 7,500*l.* on the Harewood House property. The last named obligation is capable of being dealt with at a later stage; but it is obvious that within the next few months the Society must, independently of its other difficulties, find some means of repaying to the Bank the 15,000*l.* which it has advanced, and on which interest at 4 per cent. is running against the Society. One way of doing this would of course be by the sale of the Park Royal Estate; but the present Council cannot take the responsibility of recommending this, in view of the fact that Park Royal is a rapidly improving property of which the full benefit cannot be reaped by the Society if it should have to be disposed of before the expiry, seven years hence, of the right of pre-emption at 50 per cent. advance on the purchase price, retained by the original vendor when the property was bought in 1901. Moreover the sale of Park Royal might leave the Society without any place to hold a Show except by the invitation and with the financial assistance of particular localities.

12. The Council are naturally anxious, on general grounds, that the Society's debts to its Bankers and others should be paid off as soon as possible; but at the same time they think it important that the question of the future Shows of the Society after 1905 should not be now prejudged, but should be left for final settlement in the hands of the new Council directly representative of the Members, to be elected as soon as the Supplemental Charter now being asked for has been granted. The Council regard it, therefore, as of the utmost importance that the sale of the Park Royal Estate should not at this moment be forced upon the Council, as would appear to be unavoidable to pay the Society's debts unless further financial assistance is received. They appeal therefore to all well-wishers of the Society (whether Annual or Life Members) (A) to make contributions towards paying off the Society's debts, particularly the temporary loan of 15,000*l.* obtained from the Bank, and (B) to increase their annual subscriptions for the future to such an amount as they feel disposed, to enable the Society to have a sufficient assured income to continue the various departments of public usefulness which it has carried on for so many years. The Council have already received contributions amounting in all to 1,238*l.* 17*s.* 0*d.* from 167 Governors and Members towards paying off the Society's debt; and have also been promised increased subscriptions in future years, ranging from 25*l.* to 1*l.*, from 66 Life and 42 Annual Members, amounting in all to 196*l.* 4*s.* 0*d.* per annum.

13. Volume 65 of the Journal, being the Annual Volume for 1904, is now in preparation, and bound copies will be issued to Members early in the new year. The Volume will contain the usual records relating to the Show and the work of the various scientific departments during the year, a Biography, with portrait, of Sir Humphry Davy, and articles on Fruit and Vegetable Farming, the Building of Rural Cottages, and the Agricultural Experiments of the late Mr. James Mason.

14. In the Chemical Department there has been some falling off in the number of samples sent by Members for analysis, the total for the twelve months being 530, as against 660 in 1903. To this must be added a large number of analyses in connection with the awards of Prizes for Cider and Perry at the Park Royal Show. It is satisfactory to record that the number of cases of misrepresentation or adulteration with purchases made by Members of the Society has been but small. At the same time the continued utility and need of the Chemical Department have been amply shown, and while a considerable economy has been effected in its working, it has been felt desirable to increase the facilities to Members in obtaining analyses. For this purpose a revised scale of Fees has been prepared which will give Members the same privileges as before, but at much reduced fees.

15. The work of experimental inquiry has been carried on at the Woburn Farm and Pot-culture Station; and the experiments have been visited by a considerable number of practical farmers as well as scientists. The Pot-culture Station continues usefully to supplement the Field Experiments, and Feeding Experiments have also formed part of the winter work. The financial position of the Woburn Farm threatened at one time to give rise to much anxiety, but this has happily been recently removed through the kindness of the Duke of Bedford, who has testified his interest in this branch of the Society's work by most generously supplying the deficiencies in the Farm accounts and in promising an increased annual grant to meet the future conduct and development of the inquiries carried on there.

16. The series of Grass Experiments commenced by the Society in 1895 in different parts of the country have been this year again visited by the Consulting Botanist and the Consulting Chemist, and a report embodying the general outcome of the work will appear in the next Volume of the Society's Journal.

17. Since June 1, 140 inquiries have been made of the Consulting Botanist; of these 58 have dealt with the purity and vitality of seeds, 25 with the names and properties of

weeds, and 4 with suitable mixtures to be employed in laying down land to pasture. The diseases of plants caused by Fungi were reported on, and methods of treatment were prescribed. No less than 27 different Fungi were in this connection investigated. The remaining inquiries were of a varied character.

18. Among the injurious insects which have been the subject of inquiry during the last six months, various species of aphid have been especially prominent, the prolonged dry weather in the summer having been especially favourable to aphid attack. Cases of somewhat severe injury to peas by a midge, *Diplosis pisi*, were brought to the notice of the Zoologist. This pest has hitherto attracted no attention in England. The disease of "big bud" in black currants has, as usual, been complained of in many quarters. Several Members of the Society have made inquiry as to where mite-free plants can be obtained, but none have asked for inspection with a view to supplying bushes free from disease. A group of mites, the *Tarsonemidæ*, which from their importance to horticulturists appear to deserve much more attention than they have hitherto received, has lately been under investigation.

19. The official returns of the Board of Agriculture for the past six months show that appreciable progress has been made towards the extermination of swine-fever. On the other hand, the outbreaks of anthrax have been more numerous than in the same period of last year, and the returns to date threaten to make the present year the worst, with regard to glanders, since 1892. During the past six months 300 specimens have been forwarded to the Research Laboratory at the Royal Veterinary College for examination. During the same period a number of experiments bearing on the method of infection in glanders and on epizootic lymphangitis have been carried out.

20. As the result of the examination of students of the Royal Veterinary College in Cattle Pathology, including the diseases of cattle, sheep, and pigs, Mr. Reginald L. Phillips, of Glenleigh, Marazion, Cornwall, has been awarded the Society's Silver Medal, and Mr. Ralph Bennett, of 13 Eastern Road, Romford, Essex, the Bronze Medal.

21. An Agricultural Education Exhibition was again organised by the Society in connection with the Show at Park Royal. In addition to the Society's own exhibits from the Woburn Experimental Station and Hanover Square, collections were sent by the Lawes Agricultural Trust, the Cambridge University Agricultural Department, the Essex County Council, the South-Eastern and Harper-Adams Agricultural Colleges, the Midland Agricultural and Dairy Institute, and the University Colleges of Reading and Aberystwyth. At this Exhibition

the latest developments of agricultural science and their practical results were illustrated in a complete and interesting manner, whilst the personal explanations of experts enabled a large number of daily visitors to study the exhibits with intelligence and profit. The British Forestry Exhibition, which was organised by the Society, and was located within and adjoining the same building, also proved highly successful, and was visited by large numbers interested in forestry, including many practical foresters. Demonstrations in planting and in the use of forest tools were given daily, and were well attended.

22. The Fifth Annual Examination for the National Diploma in Agriculture was held at Leeds, from May 9 to 12, 1904, when the following twenty candidates were awarded the Diploma :—

1. HENRY GORDON HIRD, Yorkshire College, Leeds. (Gold Medal and Diploma with Honours.)
2. JOHN STRUTHERS, West of Scotland Agricultural College, Glasgow.
3. ROBERT CHARLES ANDREW, Harper-Adams Agricultural College, Newport, Salop.
4. PERCY HUTCHINSON LAMB, Yorkshire College, Leeds.
5. ROBERT EDWARD SEVERS, Yorkshire College, Leeds.
6. ROBERT CHARLES GAUT, Yorkshire College, Leeds.
7. JOSEPH BLACK, Yorkshire College, Leeds.
8. ROGER PROSSER, University College of Wales, Aberystwyth, and The University, Edinburgh.
9. EDWARD BERTRAM OSBORNE, Yorkshire College, Leeds.
10. FRANCIS HOWARD BILLINGTON, Yorkshire College, Leeds.
11. WILLIAM FRANK CRASKE, South-Eastern Agricultural College, Wye.
12. JAMES KENDALL EARLE, Yorkshire College, Leeds.
13. JOHN EDWARD BRIDGES, Yorkshire College, Leeds.
14. JOHN EARLE, Yorkshire College, Leeds.
15. JOHN MILLER LONSDALE, Harris Institute, Preston.
16. THOMAS WIBBERLEY, Harris Institute, Preston.
17. CHARLES ANTHONY WILLIAMS, University College of Wales, Aberystwyth.
18. JAMES GUTHRIE STEWART, The University, Aberdeen.
19. SAMUEL GILBERT ISITT, Harper-Adams Agricultural College, Newport, Salop.
20. DAVID JONES, University College of Wales, Aberystwyth.

23. The Examinations for the National Diploma in Dairying were held this year for English students at the University College and the British Dairy Institute, Reading, from September 19 to 23, 1904, and for Scottish students at the Dairy School for Scotland, Kilmarnock, from September 26 to 30, 1904. Twenty-three candidates were examined at Reading, and of these the following sixteen satisfied the Examiners, and have therefore been awarded the National Diploma in the Science and Practice of Dairying :—

- MISS KATE AMELIA BAYNES, University College and British Dairy Institute, Reading, and Eastern Counties Dairy Institute, Ipswich.
HAROLD BURKITT, British Dairy Institute, Reading.

MISS EMILY BURKITT, British Dairy Institute, Reading.
CHRYSOSTOM J. CHRYSAKIS, University College and British Dairy Institute, Reading.
MISS GWLADYS NEST DAVIES, University College and British Dairy Institute, Reading, and Lleweni Hall Dairy School, Denbigh.
MISS EDITH MAY DAWSON, Midland Dairy Institute, Kingston, Derby.
DANIEL LINFORD FREEMAN, Lancashire C.C. Dairy School, Hutton.
ABEL EDWIN JONES, University College of Wales, Aberystwyth, and British Dairy Institute, Reading.
RAFAEL MONCAYO, University College and British Dairy Institute, Reading.
MISS ANNIE MYERSCOUGH, Lancashire C.C. Dairy School, Hutton.
MISS FELICIA ULRICA PARKINSON, Harris Institute, Preston, and University College and British Dairy Institute, Reading.
JOHN PORTER, Harris Institute, Preston, and Lancashire C.C. Dairy School, Hutton.
MISS ANNA FARQUHAR MCCONNELL, University College and British Dairy Institute, Reading.
MISS KATE MILLICENT NICKSON, Lancashire C.C. Farm, Hutton.
THOMAS WIBBERLEY, Lancashire C.C. Dairy School, Hutton.
MISS ELLA WYSE, Cheshire C.C. Dairy Institute, Worleston.

24. Eighteen candidates were examined at Kilmarnock, and eleven of them satisfied the Examiners, and have been awarded the Diploma, viz. :—

FRANCIS BILLINGTON, Elton Hall, Sandbach, Cheshire.
WILLIAM BYWATER, South View, Gomersal, Yorkshire.
JAMES KENDALL EARLE, Ellerton, Scorton, Darlington.
JOHN EARLE, Ellerton, Scorton, Darlington.
ROBERT CHARLES GAUT, 61 Belle Vue Road, Leeds.
MISS BESSIE R. KIRKWOOD, Broadstone Hall, Beith.
MISS JANET MACNAUGHTON, Montillie, Comrie.
WILFRED E. SMITH, 7 Shandon Street, Edinburgh.
MISS JEANIE W. A. SPEIR, Newton Farm, Glasgow.
HUGH STIRLING, 326 Gairbraid Street, Maryhill, Glasgow.
ROBERT M. WILSON, Laws, Duns.

25. The Sixth Annual Examination for the Diploma in Agriculture will be held at The University, Leeds, on Monday, May 8, 1905, and following days, the last date for the receipt of entries being Friday, March 31, 1905. The Tenth Annual Examination for the Diploma in Dairying will be held at Reading, on September 18, 1905, and following days, and at Kilmarnock, on September 25, 1905, and following days; and the last date for the receipt of entries for this Examination at both centres will be Thursday, August 31, 1905. The Regulations and Syllabus for both Examinations are about to be issued, those for the Examination in Agriculture having been revised by the National Agricultural Examination Board as representing the two National Societies of England and Scotland.

By Order of the Council,

ERNEST CLARKE,

Secretary.

13 Hanover Square, London, W.

ANNUAL REPORT FOR 1904 OF THE PRINCIPAL OF THE ROYAL VETERINARY COLLEGE.

RESEARCH LABORATORY.

DURING the year 1904, 654 morbid specimens were forwarded for examination to the Laboratory, established at the Royal Veterinary College in 1890, for research in Comparative Pathology and Bacteriology, and to which the Royal Agricultural Society has since made an annual grant. This is the largest number of specimens forwarded in any year since the Laboratory was established, and the fact is evidence that its usefulness is now widely appreciated. As in previous years, the great majority of the specimens were sent with a view to diagnosis in suspected cases of anthrax, glanders, tuberculosis, and other contagious diseases.

ANTHRAX.

The following Table shows the number of outbreaks of this disease, and the total number of animals attacked in these during the past year, and also allows a comparison to be made between 1904 and each of the preceding five years :—

Year		Outbreaks		Animals attacked
1899	...	534	...	986
1900	...	571	...	956
1901	...	651	...	971
1902	...	678	...	1,032
1903	...	767	...	1,143
1904	...	1,053	...	1,570

As will be seen from the Table, in respect of the prevalence of anthrax in Great Britain the past year has been considerably worse than 1903, and that was the worst since anthrax was scheduled as a contagious disease. It cannot be regarded as otherwise than very unsatisfactory that the average weekly outbreaks of this disease have nearly doubled during the last five or six years, in spite of the precautions which are now generally taken to prevent each outbreak from becoming a source of recurring mischief.

In the preceding Annual Report this subject was dealt with at considerable length,¹ and reasons were there given for

¹ Journal R.A.S.E., Vol. 64, 1903, page 262.

believing that a very considerable proportion of the outbreaks of anthrax now occurring in this country are due to a cause or causes which are not contemplated in the Anthrax Order, and are not held in check by the existing regulations. It was pointed out that when the circumstances connected with a large series of outbreaks are examined a fact brought to light is that the majority of outbreaks are not recurrent, but apparently isolated and independent. No considerable proportion of outbreaks occur on what might be called permanently infected farms; but a very large proportion of them take place in premises or on farms where searching inquiry indicates a long period of past freedom from the disease. The bulk of the animals attacked are cattle, and the victims contain an excessive proportion of adults, or at least of animals over one year old. These and some other facts have served to raise a strong suspicion that many outbreaks are caused by the importation of the germs of anthrax in foreign feeding stuffs, and especially in linseed and cotton cake. During the past year a further fact tending to incriminate cake as a cause of anthrax has been added, for a sample of Indian cotton cake, which formed part of the diet of a lot of cattle among which a serious outbreak of anthrax occurred, was experimentally proved to be capable of infecting guinea-pigs with anthrax when small quantities of the ground cake suspended in water were injected under the skin.

If, as thus appears to be probable, contaminated cake or other foreign feeding stuff is one of the causes, perhaps the main cause, of the increasing prevalence of anthrax in this country, the outlook is of rather a hopeless character. Both cotton seed and linseed are largely imported from countries in which anthrax is a comparatively common disease, and in most of these little or no care is taken to destroy carcasses or to treat them so as to minimise the risk of permanent soil contamination. There is no reason to suppose that all linseed and cotton seed imported into this country contain the germs of anthrax, but there is no difficulty in understanding how it is perhaps more than occasionally so contaminated; and, unfortunately, there is no really practicable test by which importers or merchants could assure themselves of the freedom of any given consignment of such materials from anthrax spores.

The question whether the carcasses of animals that have died from anthrax ought to be disposed of by cremation or by burial is one that appears to have caused some anxiety to various local authorities during the past year. Hitherto such carcasses have generally been buried, and the fact that outbreaks of anthrax in this country have considerably increased in frequency

during recent years has by some people been accepted as evidence that a more reliable method of destroying the germs present in anthrax carcasses is urgently required. The fact is, however, the increased prevalence of anthrax cannot be satisfactorily explained by supposing that the disease is carried on from one outbreak to another by germs liberated from buried anthrax carcasses. If that were the correct explanation a large proportion of the outbreaks would be recurrent in fields or other places containing the graves of anthrax animals; such, however, is not the case, for, as previously stated, a large proportion of the outbreaks in this country are isolated, and there is rarely forthcoming any evidence to show that there is a causal connection between two successive outbreaks on the same farm, or at least, any such connection between what may be called an anthrax grave and a later outbreak.

Certain experiments which were made in France by Pasteur appear to be responsible for the belief that burial is a highly dangerous method of disposing of anthrax carcasses, but in reality these experiments do not justify any such conclusion regarding the effect of prompt burial in this country. What Pasteur proved was that earth collected from certain places which had been used—many of them repeatedly—for the burial of anthrax carcasses contained the spores of that disease, and since worm-castings found over those graves were also proved to be capable of infecting animals with anthrax it was assumed that the earth-worms had been instrumental in bringing to the surface anthrax germs which had been buried with the carcasses. As a matter of fact, however, the results in these cases may have been due not to spores liberated from the buried carcasses and brought to the surface by earth-worms, but to spores which were left at the surface of the ground by the skinning and opening of the carcasses, which at that time was very commonly practised prior to burial. But, in any case, these experiments cannot justifiably be cited as proof that the prompt burial of an intact anthrax carcass in Great Britain involves any danger whatever of subsequent soil contamination. It is a well-established fact that when, in a temperate climate, an unopened anthrax carcass is promptly buried at a depth of a few feet no spores can afterwards be brought from it to the surface by earth-worms or any other agency, for the very sufficient reason that no spores are formed in a carcass in those conditions. In order that the bacilli present in the body may be able to form spores two conditions are absolutely necessary, the first being that the temperature must be not less than about 70° F., and the second that the bacilli must be freely exposed to the air. Both these conditions are, of course, denied to bacilli buried with the carcass in this country, with the result

that when putrefaction sets in the anthrax bacilli soon perish and the carcass becomes quite innocuous. Hence, where it is promptly carried out with unopened carcasses, burial is a perfectly safe method of dealing with animals dead of anthrax, and it has over the method of cremation the advantage that it is simpler and less expensive, and generally involves less delay. It may be added, however, that cremation has an advantage of its own, viz., that the difficulty which is often encountered in consuming by fire the entire carcass of an ox is well calculated to call public attention to the disease, and to impress upon farmers the fact that no liberties ought to be taken with any carcass when there is the least suspicion that the cause of death may have been anthrax.

SWINE FEVER.

The result of the year's operations against this disease has been a sensible reduction in the number of outbreaks. The progress which has been made towards the complete eradication of the disease is shown in the following Table:—

Year	Outbreaks	Year	Outbreaks
1897	2,155	1901	3,140
1898	2,514	1902	1,688
1899	2,322	1903	1,478
1900	1,940	1904	1,196

For the first time since the disease was taken in hand by the Board of Agriculture, the returns for the year justify the hope that swine fever will, before very long, be banished from the country, as pleuro-pneumonia and rabies have been. Such an expectation is held out not only by the reduced number of outbreaks, but also by the restricted areas to which the disease is now apparently confined. The time required for the complete extermination of the disease will depend entirely on the severity of the restrictions imposed on the movement of pigs in the areas remaining infected, and on the thoroughness of the attempts made to trace fresh outbreaks back to their source. Such restrictions are necessarily irksome to the owners of pigs, but it is to be hoped that they will be patiently borne in recognition of the fact that any slackening of them would inevitably be followed by a recrudescence of the disease. On the other hand, now that the disease has been so far suppressed, it would probably be wise, and in the end economical, if the Board of Agriculture were to treat all outbreaks by the prompt slaughter of both diseased and suspected pigs, instead of destroying only the visibly affected, and submitting the suspected animals on the same premises to a prolonged quarantine.

GLANDERS.

For years past nearly every Annual Report has had to repeat the statement that the year under review had been worse than the previous one, and the present is no exception to that rule, as the following figures will show :—

Year	No. of cases	Year	No. of cases
1899	1,472	1902	2,040
1900	1,858	1903	2,499
1901	2,370	1904	2,658

To deal at length with the causes of this unsatisfactory state of affairs would only be to repeat what has been said in previous Reports. No improvement need be expected as long as outbreaks of glanders are dealt with according to a principle diametrically opposed to the one that has inspired the regulations framed to prevent the spread of other contagious diseases. In the case of all the other contagious diseases the regulations and restrictions deal not only with the recognisably diseased animals, but also with those which are reasonably suspected in consequence of ascertained contact with affected subjects. Indeed, in some cases, anthrax for example, the restrictions which are occasionally placed on the movement of "in contact" animals are unnecessarily severe. In the case of glanders, however, when an outbreak occurs the law as a rule takes no notice of the "in contact" horses, which the owner is free to dispose of as he pleases as soon as the visibly glandered animals have been destroyed and the stable has been disinfected. In this way, in most outbreaks, the law turns its back on many affected animals, which are therefore left to perpetuate the disease in the same stable or to carry it into a new one when they are sold.

The present condition of affairs—or a worse one—will have to be endured as long as effect is not given to the recommendations which were made by the Departmental Committee on Glanders (1899). At the present time the disease occasions an annual loss which cannot be placed at less than 50,000*l.*, and an additional incentive to endeavour to suppress it is furnished by the fact that it every year claims a number of human victims among those who are, generally unwittingly, attending to glandered horses.

THE IDENTITY OF HUMAN AND BOVINE TUBERCULOSIS.

In some paragraphs which appeared under the above heading in the preceding Annual Report a short account was given of the results arrived at by the German Commission,

which, mainly at the instigation of Professor Koch, was appointed to investigate experimentally the question so hotly discussed at the British Congress on Tuberculosis in 1901, viz., whether human and bovine tuberculosis are identical diseases. At the Congress in question Professor Koch had maintained that the two diseases were different, and had also expressed himself in terms which seemed to indicate that in his opinion the bovine disease was not transmissible to human beings. The experiments of the German Commission referred to above yielded results which made it impossible to hold that view, since in four cases of human tuberculosis, out of a total of forty examined, the lesions were found to contain bacilli which were capable of infecting cattle with tuberculosis, and had, according to Professor Koch's own dictum, to be regarded as the bacilli of bovine tuberculosis.

During the course of the past year the Royal Commission on Tuberculosis, which was appointed in 1901 to investigate the same question, issued an interim report, in which it is stated that at the date of the report the Commission had investigated over twenty cases of human tuberculosis, and had in seven of these found that the bacilli present in the human lesions were immediately capable of infecting cattle with an acute form of the disease. If one admits the soundness of Professor Koch's reasoning, in these seven cases of human tuberculosis the patients must have been infected with the bovine disease. The reports of the German and British Commissions are thus in agreement, except that the latter found that the human disease was transmissible to cattle in a larger proportion of cases.

Perhaps one might say that the two Commissions appear to be in agreement with regard to the main point, which is that human beings may become infected with the bacilli which are the cause of tuberculosis in cattle. Precisely how frequently this transmission of the disease from cattle to man occurs is still a matter of dispute, and it may be a very long time before there is anything like general agreement with regard to that point.

ERRORS IN THE TUBERCULIN TEST.

The reliability of the tuberculin test, when carried out under what may be called proper conditions, is now universally recognised. The most important of these conditions are (1) that the cattle to be tested should be standing undisturbed in premises to which they have become accustomed; (2) that they are in apparent health, or at least not suffering from anything which renders their temperature high or unsteady; and (3) that they have not recently been tested with tuberculin. It has hitherto been customary to insist upon the last

of these conditions, and to allow a period of not less than four weeks to elapse between the first and second injections when for any reason the test has to be repeated. It has long been known that even when the test is carried out in the ordinary way (the temperature being taken three or four times with intervals of three hours, starting from the ninth hour after injection) many tuberculous animals will react a second time in much less than a month, but any shorter period than a month has generally been regarded as insufficient to counteract the effect of a previous reaction. It was easy to foresee the use to which dishonest persons would put this tendency of a first reaction to tuberculin to prevent a tuberculous animal from reacting again for a certain period afterwards; and in practice it has not hitherto been easy to circumvent this improper use of tuberculin, as it is often highly inconvenient or impossible to delay the test of a newly-purchased animal for a month when there is any suspicion that it may have been dishonestly treated with tuberculin immediately before sale.

This matter is referred to here, because certain experiments which were carried out by Professor Vallée in France, during the past year, indicate a very simple method of detecting this fraud. All that is necessary is to give double the ordinary dose, to start taking the temperature of animals under the test at the second hour after the injection of tuberculin, and to continue taking it at intervals of two hours up to the sixteenth hour. M. Vallée found that when the second test was carried out in this way, even as early as forty-eight hours after the first, not a single animal which had failed to pass the first test would have passed the second. It is, of course, much less convenient for veterinary surgeons to carry out the test in this way, but, as it appears to afford a much better guarantee that a tuberculous animal will not escape detection, those who purchase valuable animals subject to the condition that they do not react to tuberculin would do well to insist that this modified form of the test should be carried out. It ought to be added that M. Vallée found that the test when conducted in this way did not provoke a reaction in non-tuberculous cattle, and a seller who warrants his animal free from tuberculosis has therefore no ground for objecting to the new procedure. Where, however, a double dose of tuberculin is objected to by the seller, there would probably be little risk to the purchaser if the test were made with an ordinary dose, provided the temperature were taken at the times stated above.

EPIZOOTIC LYMPHANGITIS.

This affection was referred to in the last Annual Report as a new disease among horses in Great Britain. The first cases

were detected among army horses during 1902, and up to the close of last year only one case had been recognised outside cavalry and artillery stables. This was a horse belonging to a poor man which was brought to the Free Clinique at the Royal Veterinary College in the month of October, 1903, presenting symptoms closely resembling those of farcy. Microscopic examination of pus from the sores on the near hind leg, which was much swollen, showed the presence in it of the peculiar micro-organism (the so-called cryptococcus) which is the cause of epizootic lymphangitis, and the horse was therefore detained and kept isolated until it was destroyed.

It is well known that during the past year the disease has been rampant in several Government stables, and a great many horses have been destroyed in an endeavour to stamp it out, while it is reported that one dépôt has been closed in consequence of the repeated recurrence of cases. A more alarming fact is that several further cases have been detected amongst horses belonging to private owners, and there is the greatest reason to fear that the disease has now so far established itself in this country that its eradication will be difficult or impossible. In respect of the appearance of the lesions, the disease presents a remarkable likeness to farcy, and, although its ordinary course is chronic, and not accompanied by serious constitutional symptoms, it is scarcely less to be dreaded than glanders and farcy. Indeed, in one respect, it is more to be feared, for, whereas occult cases of glanders can now be readily detected by means of the mallein test, it is at present quite impossible to diagnose a case of epizootic lymphangitis until the outward lesions have developed, and by that time the contagion may have spread to other horses in the same stable. Besides, although the disease does not ordinarily at the outset seriously affect the horse's general condition, it often in the end proves fatal, or renders the animal unfit for work, apart from the fact that its strict isolation is necessary in the public interest. In short, the interests of the owner and of the public are alike best served by destroying every horse affected with epizootic lymphangitis as soon as the disease is diagnosed. It is true that in a considerable number of cases the outward symptoms after a time disappear, but many apparent recoveries are not real, and relapses may occur after long periods of apparent health. This has been well illustrated by some experiments which have been carried out at the Royal Veterinary College. In one case a pony was proved by post-mortem examination to be still infected more than a year after the outward symptoms had entirely disappeared.

Although the fact is not capable of absolute proof, there can be no doubt that epizootic lymphangitis was introduced

into this country by army horses which were returned from South Africa after the late war, as it is well known to have been in existence there for a good many years.

As previously stated, the symptoms of epizootic lymphangitis closely resemble those of farcy, and in both diseases they take the form of sores, which burst through the skin and discharge matter. In either disease these sores may form on any part of the body; but a favourite seat is on the legs, particularly the hind ones. In both diseases the leg on which the sores develop is much swollen, and when the disease attacks the skin of the body, neck, or head, the adjacent sores are often connected by subcutaneous cord-like thickenings, which correspond with inflamed lymphatic vessels.

As both diseases are now scheduled under the Diseases of Animals Act, and fall to be notified to the police, their liability to be confounded with one another by the layman is not a matter of much consequence. What is important is that their common symptoms should become as widely known as possible, in order that cases of either disease may be promptly suspected and reported.

CANINE DISTEMPER.

During the past year some experiments intended to test the efficacy of a particular form of vaccination against distemper were concluded at the Royal Veterinary College. The experiments formed part of a series which were designed by a Committee of Veterinary Surgeons, and begun in the summer of 1903. The first of the series were carried out in premises which were specially selected with the object of guarding against the accidental infection of the experimental puppies before the vaccination had had time to take effect. Unfortunately, what had been feared actually happened, with the consequence that these earlier experiments yielded inconclusive results. On the other hand, the experiments at the Royal Veterinary College were carried out without any accident, and the results which they yielded were quite unambiguous.

The method of vaccination or protective inoculation which the experiments were intended to test is one associated with the name of a French doctor, M. Phisalix, who claimed that he had discovered the germ of distemper, and by cultivating it artificially had been able to prepare a vaccin, which, when injected into young dogs, protected them against the disease. M. Phisalix's statements with regard to the latter point were supported by a certain amount of what may be called clinical evidence; and his vaccin has, within the last few years, been used by a considerable number of veterinary surgeons in London and elsewhere in this country. However, from the experience gained in this way no certain conclusion could be drawn, and

it was for this reason that the Committee referred to above determined to test the efficacy of the vaccin, by experiments carried out under conditions that would be more likely to show whether it had any real value.

The plan of the experiments was to take an equal number of young dogs belonging to the same litters, and which had never had distemper, and, while vaccinating one set according to the method of M. Phisalix, to leave the other set unvaccinated, the latter serving as control animals when both sets were afterwards exposed to the contagion of distemper.

In the experiments carried out at the Royal Veterinary College the animals used were drawn from two litters of puppies, viz., four collies and four Irish terriers. Two of each were vaccinated with Phisalix vaccin, and after several weeks, during which the whole eight puppies appeared to be quite well, they were simultaneously exposed to infection by placing among them dogs suffering from distemper. Both in the case of the collies and the Irish terriers the results were entirely opposed to the view that the vaccination had conferred any protection against distemper. The first animals to contract the disease after exposure to infection were the two vaccinated collies, and both of them died in consequence. The two unvaccinated collies also became affected, but while one of them died from distemper the other recovered.

In the case of the Irish terriers, one vaccinated and one unvaccinated pup caught the disease and died from it, while the other two (one vaccinated and one unvaccinated) survived, and, indeed, never developed any distinct evidence of the disease.

In face of these results it is impossible to maintain that the operation had been of any value to the four vaccinated animals. There are also grounds for believing that the bacterium present in the vaccin has nothing whatever to do with distemper, and that this is the reason why the vaccin fails to confer any protection.

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ANNUAL REPORT FOR 1904 OF THE CONSULTING CHEMIST.

It is, perhaps, hardly surprising that a diminution rather than an increase in the number of samples sent to the Consulting Chemist for analysis has taken place. As against 660 samples sent in 1903, only 530 were forwarded during a corresponding period in 1904.

Before passing to the consideration in detail of particular points which have been brought out by examination of the various samples sent by members, I may briefly comment on one or two features of the year's work. In the first place I would wish to refer, with an expression of sincere regret, to the death, during the year, of my late colleague, Dr. A. P. Aitken, the Chemist of the sister society—the Highland and Agricultural Society of Scotland. For a long term of years Dr. Aitken filled, with ability and distinction, this responsible position, and during the whole of it our relations were of the most cordial kind.

An important matter bearing upon the Society's work in the Chemical Department was the appointment of a Departmental Committee of the Board of Agriculture to consider the working of the Fertilisers and Feeding Stuffs Act, 1893, and what amendments of it might be called for. A large mass of evidence was taken, and the Royal Agricultural Society was represented by Mr. Bowen-Jones, Chairman of the Chemical Committee, and by myself. The Report of the Departmental Committee is expected to appear shortly.

Another matter of interest is the renewed attention drawn to this Act by a circular of the Board of Agriculture. This circular sets out the results of action taken in the Lindsey Division of Lincolnshire, where several prosecutions have been successfully carried through. These had reference more particularly to linseed cake, sold as such, but not proving to be "pure," and to cotton cake, invoiced as Egyptian, but found to be mixed more or less with seed of Bombay or other origin.

The analyses of the Royal Agricultural Society are, however, not confined to the settlement of questions of purity and conformity with invoiced descriptions; not only are these dealt with, but information and advice as to use and comparative value, as well as chemical composition, are given—matters outside the domain of the Fertilisers and Feeding Stuffs Act.

It is a cause for regret that the misleading term “95 per cent.,” as applied to linseed cake, continues in some quarters to be used. It is not long since that a powerful organisation—the British Oil and Cake Mills—announced their intention to sell in future all linseed cakes according to the Society’s guarantee of “pure” and to give up the term “95 per cent.” They and some other firms have, however, not as yet adopted this desirable plan in its entirety; they contend that some of their purchasers still demand this form of guarantee and will not be satisfied with the description “pure.” This may be so in some cases, but it has to be remembered that the objectionable term was one introduced by the manufacturers and not by the purchasers; and while the latter, it is true, are very conservative in their methods and, when they receive something different or described differently from what they have had before, get suspicious, yet the real fault lies with the makers, and it is clearly in their power to alter the practice. I have often pointed out the objections to the use of the term “95 per cent.,” and I would again remind purchasers that it provides no secure guarantee to them, but that they should stipulate for “pure” linseed cake only. The answer comes from some that if they were to do this they would have to pay more for practically the same cake; this again is a matter in the hands of the makers. It is to my mind indeed very questionable whether a guarantee in terms of “95 per cent.,” as applied to linseed cake, is a proper one under the Fertilisers and Feeding Stuffs Act. The Act specifies that a cake, if sold as “linseed cake,” must be “pure,” and there seems to me no warranty for a description in terms of “95” or other per cent. “pure.” A cake that a maker will not sell as “pure” linseed cake ought, in my opinion, to be sold as “oil-cake” or by some name indicating that it is *not* pure.

While certain advantages of the Fertilisers and Feeding Stuffs Act have been set out, there are also disadvantages connected with it. One of these is that, in consequence of the rigid interpretation of the terms of guarantee as contained in invoices, manufacturers and vendors, in order to be on the safe side, decline to give a guarantee in terms as high as the material often warrants. This applies in particular to basic slag, which has been the subject of several and, in my opinion,

ill-advised, prosecutions. There is, I consider, a great difference, and one that should be drawn, between an accidental deficiency in quality, such as may quite unintentionally occur, and which may be readily adjusted by the giving of an allowance, and a wilful falsification, such as occurs when, for example, Egyptian cotton seed is mixed with Bombay seed and sold as "Egyptian cotton cake," or when linseed is mixed with weed seeds, sand, and other adulterants. The result is that even high-class firms will not run the risks involved in a prosecution, and, in order to avoid it, give a guarantee in terms of which the following are examples :—

- (a) "*Basic slag*.—Phosphates 30-35 per cent. In case the analysis should be below 30 per cent. of total phosphates, sellers to make a pro rata allowance in the usual way, but, for the purpose of the Fertilisers and Feeding Stuffs Act, it is agreed that sellers only guarantee 25 per cent. of total phosphates."
- (b) "Should it be proved that the total phosphates are less than 38 per cent. we agree to allow for any deficiency, and we fully expect that when you analyse it you will find the deliveries *higher than this*. But, for purposes of the Fertilisers and Feeding Stuffs Act, our guarantee is 5 per cent. total phosphates less than above. Our guarantees are intended to be *substantially on the safe side*."

On the general subject of the prevalence of adulteration, it has to be recorded that, so far as fertilisers are concerned, there has been practically nothing amiss found. The supply of fertilisers may be considered as in a most satisfactory state, due largely, no doubt, to the action of the Chemical Manure Manufacturers' Association. In feeding stuffs, and more particularly in the case of compound cakes, feeding meals, &c., there continue to come under notice instances of worthless and waste materials being incorporated with genuine ones. Attention is also called to the need of care being exercised in the purchase of certain materials in use on the farm, *e.g.*, sulphate of copper, and white lead.

A. FEEDING STUFFS.

1. *Linseed Cake*.

No new form of adulteration has been brought to light, and the cakes analysed have, as a rule, been very satisfactory as regards purity. In my last Annual Report I dealt at some length with the question of the feasibility of insisting on a guarantee of a certain percentage of oil, nitrogen, &c., in linseed cakes, and I pointed out that this was not practicable and ought not to be expected. A good deal of evidence on this point was submitted to the Departmental Committee on the

Fertilisers and Feeding Stuffs Act, together with the results of trials by myself and others, fully bearing out my contention. I have seen nothing since to alter my opinion, but rather the reverse. The only security is to have a fair average sample of a delivery analysed.

There continue to come to light materials which are offered, principally to manufacturers up-country by dealers in Hull, with the intention of their being incorporated in linseed cake. Correspondence recently passed into my hands in which a quantity of 10 to 20 tons of "nutmeal" was offered at 50s. per ton f.o.r. Hull, and a quantity of 10 tons "seeds" at 42s. 6d. per ton f.o.r. Hull, with the recommendation: "These seeds are used by the chief linseed cake manufacturers in Hull." The "nutmeal" was merely the ground-up husks of earth nut, and the "seeds" were weed seeds screened from clover. I am happy to say that, though some makers may use these materials, the statement is certainly not true as regards the "chief linseed cake manufacturers in Hull."

2. *Uncorticated Cotton Cake.*

Ample reference has been made already, and in my last Annual Report, to the "Egyptian" and "Bombay" seed question. I have only to add that a further year's experience has convinced me of the possibility of discriminating between the two sets of seeds, though the matter is by no means an easy one; while, as regards what one hears of the good results obtained by feeding with Bombay cake, it all depends, in my opinion, upon what sort of Bombay cake it is that is used. There are Bombay cotton cakes that are carefully made and which may be little, if at all, inferior to some Egyptian cakes in feeding value, while there may be others which, by reason of their excessive "woolliness" may be positively dangerous to use. The latter almost always show comparatively high percentages of sand. Such were the following:—

	A	B
Moisture	12.45	12.19
Oil	4.93	4.36
¹ Albuminous compounds (flesh-forming matters)	22.56	18.87
Carbohydrates, &c. . . .	53.69	37.94
Woody fibre (cellulose) . .	17.62	18.80
² Mineral matter (ash) . . .	8.75	7.84
	<hr/> 100.00	<hr/> 100.00
¹ Containing nitrogen . . .	3.61	3.02
² Including sand	3.30	2.09

3. *Decorticated Cotton Cake.*

The oft-repeated complaint continues that it is extremely hard to get a decorticated cotton cake of good quality, soft in texture, free from lumps, and well decorticated. Occasionally good cakes come to the fore, but these, as instanced in the following case, are, I believe, manufactured in this country by a special process to which I have, in previous years, drawn attention :—

Moisture	7.90
Oil	18.36
¹ Albuminous compounds (flesh-forming matters	36.75
Carbohydrates, &c.	24.79
Woody fibre (cellulose)	5.30
² Mineral matter (ash)	6.90
	<hr/> 100.00
¹ Containing nitrogen	5.88
² Including sand80

This cake was sold as "English decorticated cotton cake," and the price was 7*l.* 7*s.* 6*d.* per ton in January, 1904.

4. *Maize.*

The following analyses of samples of three different kinds of maize (unground), American flat, River Plate, and Danubian, may be of interest. It should be remarked, however, that it is not alone the chemical composition, but also the relative "hardness" of samples, that must be taken into consideration when comparing such samples. The flat American maize was much the best in this latter respect, and it will be noted that it was the richest in starch and the lowest in albuminoids.

	American flat maize.	River Plate maize.	Danubian maize.
Moisture	13.18	13.45	13.68
Oil	3.89	5.20	3.96
¹ Albuminous compounds (flesh-forming matters)	8.94	10.19	9.63
Starch, digestible fibre, &c.	71.40	68.27	70.13
Woody fibre (cellulose)	1.40	1.49	1.46
² Mineral matter (ash)	1.19	1.40	1.14
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00
¹ Containing nitrogen	1.43	1.63	1.54
² Including silica05	.05	—

5. *Pig Meal.*

Anything almost, as has often been remarked, will “pass” as pig meal.

The following is an instance of a waste material of little value so used :—

Moisture	10.39
Oil	1.03
¹ Albuminous compounds (flesh-forming matters)	3.25
Starch and digestible fibre	53.69
Woody fibre (cellulose)	27.25
² Mineral matter (ash)	4.39
	<hr/>
	100.00
	<hr/>
¹ Containing nitrogen52
² Including sand and silica	3.09

This was really oat offal, and cost 2*l.* 15*s.* per ton in London, a price much in excess of its real value.

B. FERTILISERS.

The generally satisfactory nature of the supply of these has been commented on. The ordinary manufactured fertilisers, such as superphosphate, dissolved bones, &c., have almost always come up to guarantee. So, too, has basic slag, though the reason for this, in the giving of a safeguarding guarantee, has been referred to. Peruvian guano continues to be an article that can be obtained, and several very high-class lots have been met with.

1. *Basic Slag.*

High quality samples of this were the following :—

Percentage of—	A	B
Phosphoric acid	23.21	24.78
Equal to phosphate of lime	50.66	54.09
Finessess	85.50	84.00

“A” was a purchase of 35 tons, bought at Liverpool at 2*l.* 11*s.* 6*d.* per ton, with a guarantee of 42 per cent. of phosphates. It will be seen that the quality turned out 8½ per cent. above the guarantee.

“B” was a purchase of 33 tons, purchased at 2*l.* 6*s.* per ton, delivered at Newark, Notts., under a guarantee of 38.45 per cent. of phosphates. It came out no less than 16 per cent. above the minimum guarantee.

2. *Peruvian Guano.*

Although it was supposed at one time that the stores of Peruvian guano were worked out and that no more would be

obtainable, it has been found that the islands, if left undisturbed, are soon occupied again by the sea birds, and fresh deposits are formed which accumulate sufficiently by the end of twelve or fourteen years to enable them to be worked again, rich supplies being then obtainable. Such are the following :—

	A	B
Moisture	19.92	20.98
¹ Organic matter	44.53	44.32
Phosphate of lime	21.77	21.83
² Alkalies, &c.	10.84	9.89
Insoluble siliceous matter	2.94	2.98
	<hr/> 100.00	<hr/> 100.00
¹ Containing nitrogen	12.61	12.35
Equal to ammonia	15.31	14.99
² Containing phosphoric acid	3.16	2.99
Equal to phosphate of lime	6.89	6.53
Total phosphate of lime	28.66	28.36

These were both very high-class Peruvian guanos, and would command a ready sale. They cost 12*l.* 15*s.* per ton on rail in London, and were well worth the money.

3. *Meat Manure.*

A delivery sold in Kent under this name, at 50*s.* per ton, was supposed to contain 7 per cent. of ammonia. The analysis of a sample of it submitted to me showed it to contain only about one-third of this amount, and the material was wet, and worth nothing like the price asked. The analysis was :—

Moisture	44.50
¹ Organic matter	30.53
Phosphate of lime	2.47
Carbonate of lime, &c.	10.76
Sand	11.74
	<hr/> 100.00
¹ Containing nitrogen	2.03
Equal to ammonia	2.46

4. *Town Refuse.*

This class of material is, of course, of very variable nature, and the uncertainties of giving a fair value to it are much increased by the difficulty attending the obtaining of a representative sample where old tins, boots, pieces of china, glass, &c., often form a considerable part of a delivery. However, I had occasion to get a large and fairly representative

sample of town refuse from a Midland district, and, after careful sifting and mixing, and making allowance for the proportion of coarse rubbish it contained (and which could have practically no manurial value), I obtained the following as the general composition of the sample in its natural whole state :—

Moisture	23·96
¹ Organic matter	25·92
Lime	1·89
² Phosphoric acid	·67
Oxide of iron, &c.	36·61
Insoluble siliceous matter	10·95
	<hr/>
	100·00
	<hr/>
¹ Containing nitrogen	·51
Equal to ammonia	·61
² Equal to phosphate of lime	1·45

The proportion of coarse rubbish was 27 per cent. and of fine rubbish and ashes 73 per cent. In the application of such a material one ought to take into consideration the nature of the land to which it is to be applied; some lands of stiff heavy character may be improved mechanically and physically by the turning in of rubbish of this class which “opens” them out and improves drainage; others again may be benefited by the increase of organic matter and the better retention of moisture, while on other soils the further opening of the soil and consequent want of consolidation may be the very worst thing for them.

5. Ground Lime.

Much has been written about the advantages of using “ground lime,” *i.e.*, lime which, after being burnt, has been ground finely in a mill. Instead of giving a heavy dressing of lime—say 2 tons or 4 tons per acre—it is maintained that as good a result can be obtained by using smaller dressings of a few cwt. at a time at small expense, if the lime be first well ground, the distribution being so much better and the action quicker. My own experience in this direction has been that “ground lime” is hard to obtain, and that even when obtainable it is not infrequently found to be of inferior quality, as the following analysis of a sample from York shows :—

Percentage of—	
Lime (CaO)	64·05
Oxide of iron and alumina	5·79
Silica	15·18

Over 20 per cent. of this was stone and other matters not “ground lime.”

6. *Sulphate of Potash.*

When purchasing sulphate of potash for manurial use, and when it is intended to employ this mixed with ammoniacal materials like sulphate of ammonia, Peruvian guano, &c., it is advisable to remember that, in addition to the natural salt obtained from the potash mines in North Germany (Stassfurt), there is another kind of sulphate of potash in commerce which is obtained as the product of certain manufacturing processes. This latter contains a certain amount of carbonate of potash in addition to the sulphate of potash, and though this is immaterial if the salt be used by itself, yet it will not do for mixing with sulphate of ammonia, Peruvian guano, or other ammoniacal materials, as some loss of ammonia may then arise.

C. MISCELLANEOUS MATERIALS.

White Lead.

It is desirable to call attention to the fact that "white lead," properly called, is basic carbonate of lead, as made by the old or "Dutch" process, but that another material, which is sometimes sold under the name of "English white lead," is made by another process, and is not carbonate of lead, but sulphate of lead. The superiority of the former consists in the better "covering power" which it possesses. The use of the term "white lead" as applied to the latter article is, to say the least, misleading, and purchasers intending to get the carbonate should stipulate for "pure white lead."

Remarking on the importance of paying attention to the obtaining of genuine white lead and pure linseed oil for estate work, a correspondent writes to me: "I am so satisfied as to this that I make special efforts to obtain them, and the broad result has been that, whereas under the old system of entering into contracts with painters to find all labour and materials, I had to paint every three years, under the present regulations I select *all* materials, and I find it necessary only to renew the painting every six years."

A large number of samples of cider and perry were analysed in connection with the Society's Exhibition at Park Royal in the summer, the results being made use of when awarding the prizes in the several classes.

The following is a list of the samples analysed for members of the Society between December 1st, 1903, and November 30th, 1904:—

Linseed cakes	81
Undecorticated cotton cakes	40
Decorticated cotton cakes	12
Compound feeding cakes and meals	49
Cereals	7
Rice meal	1
Dried grains	2
Superphosphates	41
Dissolved bones and compound manures	25
Raw and steamed bones	26
Peruvian guanos	18
Fish and meal guanos	9
Basic slag	36
Nitrate of soda.	9
Sulphate of ammonia	7
Potash salts	8
Shoddy	8
Hoofs and horns	3
Rape and other manure cakes	2
Limes	4
Roots	6
Waters	81
Soils	11
Butter, milk, and cream	15
Miscellaneous	29
	<hr/>
	530

J. AUGUSTUS VOELCKER.

13 Hanover Square, W.

ANNUAL REPORT FOR 1904 OF THE CONSULTING BOTANIST.

FROM December 1, 1903, to November 30, 1904, the Consulting Botanist received 299 applications, and duly dealt with them. The greatest portion of them, 181 in number, were samples of clover and grass seeds, submitted for determination of their value. Thirty-seven others sought advice in relation to diseases affecting farm crops, and methods of dealing with them. In 31 cases information was supplied regarding the names and properties of plants. Three were inquiries about suitable seeds for laying down land for pastures, whilst 5 seed mixtures were examined as to their respective value for sowing. The remaining applications were less important, and were of miscellaneous nature.

Several communications from Government Departments, both at home and abroad, were dealt with. An officer of the Natural History Museum inquired on behalf of the authorities of East Africa as to the best method of killing insects in or on cotton seed, without injuring its germinating power. He was recommended to steep the seed for fifteen minutes in water kept at a temperature of 140° F., which would effectually kill the insects.

Seed from Scotland and England was applied for and transmitted to the German Agricultural Society (Deutsche Landwirtschafts Gesellschaft) for the purpose of their experiments with ryegrass seed of different origin. A similar request was made by Professor Rampelli, of the Agricultural Experiment Station at Rieti, Italy, for the principal varieties of cereals grown in this country. An extensive series was obtained and transmitted to him.

PURITY AND GERMINATION.

Owing to the deficient harvest in 1903 of English seed, large quantities of foreign seed had to be used, especially of clover. No doubt this accounts for the remarkably high percentage of samples infested with dodder, 25 per cent. containing the seeds of this troublesome pest. Of the grasses, meadow grass showed the least germination, one sample germinating only 25 per cent. A sample of hard fescue showed after sixteen days'

test no germination whatever. A farmer sought advice as to the vitality of turnip seed which failed in his field. The test and dissection of the seeds showed that they were all dead. Two samples of wheat were sent for examination. The sender doubted whether the first one would grow at all. The other, from a different source, was bought for "new" seed. The former grew 98 per cent., the latter 21 per cent. These are striking examples of the necessity of seed testing.

Eight samples of grasses contained ergot, and were declared unfit for use. Much too little attention is given to the danger of having ergot present in grass seed. The fungus developing the black sclerotia is capable of attacking any kind of grass and cereal.¹ Hay contaminated with this fungus has proved injurious to stock fed on it. One seedsman who supplied a member with timothy containing a considerable quantity of ergot was much surprised at my condemning his sample; the black "specks" in it, being the small sclerotia of the fungus, having been taken by him for excrements of insects; and he further suggested that ergot was hardly ever found in seeds of timothy.

Of the five seed mixtures sent for examination, one contained dodder, and two were of poor quality, showing in one case 47 per cent., and in the other 46 per cent. of impurities. The warning against the purchase of such mixtures needs still to be insisted upon. Old and impure seed is often included in "ready mixed" seeds.

IDENTIFICATION OF PLANTS.

During the year, 31 inquiries were made by members as to the names of plants, and the methods of eradicating different weeds. Reference may be made to one or two of these. Two plants of the same natural Order, *Caucalis nodosa* Scop. (henfoot) and *Petroselinum segetum* Hoffm. (corn parsley), were sent from Gloucestershire under the impression that they might have caused the death of lambs. Of these plants no poisonous property is recorded, but lambs frequently injure themselves by greedily consuming and overloading their stomachs with plants that possess no poisonous properties.

An interesting inquiry was received from a member regarding the seeds of charlock. He wondered why in this country no use was made of these seeds. "It would pay," he suggests, "in a year of abundance like the present one to have it threshed, which would be preferable to suffering from it and then having to burn it. In the Argentine I sold it for making 'finest olive oil' for household purposes; it being much used by Italians for cooking. It fetched the same price as linseed,

¹ See article "On Ergot" in Journal R.A.S.E., Vol. 35, 1874, pp. 443-458.

sold for that purpose." Whether charlock would be a paying crop for this country cannot be stated, but it may be worth trying to find some use for this noxious plant, the seeds being plentifully developed, and the plants requiring little or no cultivation.

DISEASES OF PLANTS.

Diseases were investigated on the following plants :—

Cereals.—Oats came from Salop with *Helminthosporium gramineum* Eriks. An illustrated description of this fungus and the means of dealing with it were given in my Report for the year 1900. Barley was received from Yorkshire with *Erysiphe graminis* D.C. This fungus very frequently attacks cereals and grasses, and has repeatedly done serious mischief. It covers the leaves with a fine mould and penetrates the tissues, especially the younger blades. The leaves become yellow and the plants die. It is usually observed on patches of dying plants on the field, and it should be combated as soon as these are noticed by removing the plants and burning them and by spraying the neighbouring plants with Bordeaux mixture.

Clovers and grasses.—Red clover and suckling clover were received from Bedfordshire and Norfolk attacked by *Erysiphe Martii* Lev. Red clover was received from Hertfordshire with *Pseudopeziza Trifolii* Fuckel, and suckling clover from Norfolk with *Uromyces Trifolii* Lev.

Erysiphe Martii Lev. (see Fig. 1, N to R, page 262) attacks clovers in the same manner as the species found on grass that has just been referred to. It becomes serious only in a severe attack ; it should be dealt with as the *Erysiphe* on grass. *Pseudopeziza Trifolii* Fuckel (see Fig. 1, F to K, page 262) is found on lucerne and clovers. The leaves of the diseased plants show small dark-brown spots of decaying tissue, in the middle of which a minute receptacle is situated, the fruiting body of the fungus which is filled with very minute sacs or asci containing eight microscopic spores. These are shed when ripe and are capable of infecting the leaves of healthy plants. The disease is not very serious and can be kept in check by the frequent cutting of the crop. It generally occurs on stray plants on the field in the late autumn. To prevent the carrying of the fungus over to the next year dry refuse should be spread over the attacked parts of the field, which being set on fire consumes the infested leaves.

Uromyces Trifolii Hedw. attacks the species of *Trifolium* and other leguminous plants and forms dark reddish-brown patches of uredospores, making the leaves appear as if covered with rust. The spots are very minute, but can readily be seen with the naked eye, as they appear in large numbers, and often cover the whole upper and under surface of the leaves.

The uredospores are followed by teleutospores (rest spores), which have thick walls, an efficient protection to carry them through the winter. This disease should be treated like the *Pseudopeziza* attack.

From Yorkshire samples of diseased tall oat grass were received. The fungus which had destroyed the grains in the husk was *Ustilago perennans* Rostr., a species of the well-known smut fungus. The applicant was advised to collect and burn the diseased plants; letting them continue to grow would endanger the cultivation of cereals and pasture grasses in the following year.

Mangel wurzel and turnips.—Leaves of mangel wurzel covered with large brown spots of dead tissue were examined. These were killed by *Cercospora beticola* Sacc. (see Fig. 1, A and B, page 262). At the beginning the spots are very small, but they increase in size as quickly as the mycelium of the fungus spreads in the tissues. Wind and rain toss the leaves about, and consequently the dead portions become detached, fall out, and leave holes of various size in the leaf. Besides this fungus another inhabited the leaves, and was identified as *Uromyces Betæ* Kühn., (see Fig. 1, A, C to E, page 262). This is another species of the group which was found on the suckling clover. The nature of an attack and the history of the fungus are closely related to that species and need no repetition. It was advised to collect all diseased leaves and burn them, as soon as spots of this kind are observed. If the fungus were allowed to remain, it would kill the leaves and little or no nourishment could be stored in the roots, causing serious loss in the ripening and weight of the mangels. Some turnips affected by "finger-and-toe" were received. This is caused by a parasitic fungus, *Plasmodiophora Brassicæ* Wor.¹ The remedy lies in the application of lime. A bacterial attack on turnips received from Lincolnshire was investigated, and found to be identical with the disease described in an appendix to my Report for 1900.²

Potatoes.—In March I received some potatoes from Lincolnshire, covered with numerous bluish-black warts of about a quarter of an inch in diameter (Fig. 2, page 264). When thinly peeled a dark-brown patch was found below each wart, and if crowded together the patches became confluent. On dissecting these patches the cells of the potato were found to be permeated by threads of very fine mycelium. The fungus had consumed the cell contents and thickened the cell walls, forming a corky layer which separated the diseased part from the healthy cells. No fructification or other characters helping

¹ Journal R.A.S.E., Vol. 54, 1893, pp. 334-339.

² *Ibid.*, Vol. 61, 1900, pp. 738-741.

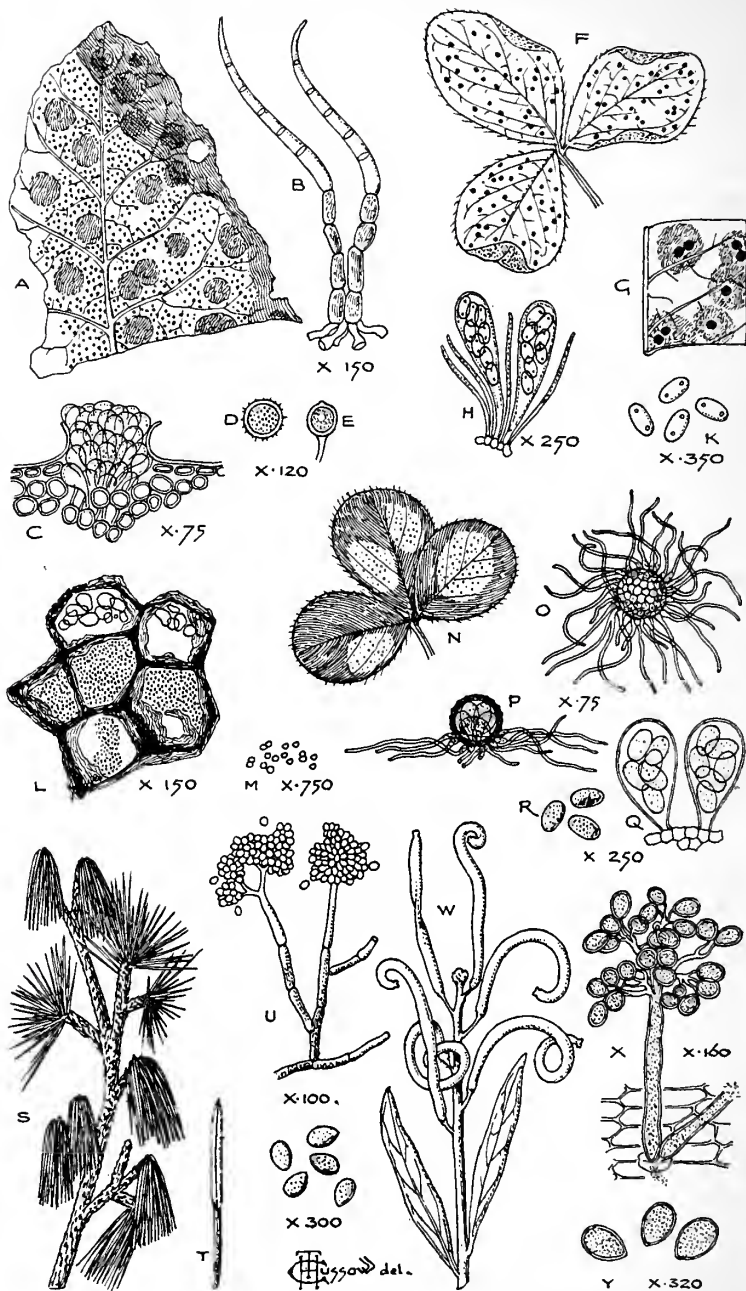


FIG. 1. Parasitic Fungi (see Explanation opposite).

to the determination of the fungus were present. The tubers were planted and kept under constant observation, but no further development of the disease showed itself. They are still under observation.

From Lancashire some tubers were received covered with the conidial growth of the fungus *Nectria solani* R. & Bert. The fungus in this stage is called *Fusarium solani* Sacc.; it causes a wet rot of potatoes placed in pits. When filling the pits, care should be taken that no injured potato is placed amongst the healthy ones, for this fungus quickly spreads to neighbouring healthy tubers. The darkness, moisture, and temperature of the pit supply conditions very favourable to the growth of the fungus. Indeed, damaged tubers of potatoes or other roots should be carefully excluded from the place of storage, as they offer suitable conditions to various fungi and bacteria.

Another potato was sent for examination. It was a case of the well-known disease called potato scab. There are different opinions on the cause of this disease, some attributing it to a fungus, *Sorosporium scabies* Fisch. de W., of the smut group, others to the presence of bacteria. On very careful observation I found plenty of bacteria living on the contents of the cells (see Fig. 1, L and M, page 262). No other fungus was observed. It is recommended to powder the potatoes with flowers of sulphur if they are thus attacked. The disease

Explanation of Fig. 1.—Parasitic Fungi (see page 262).

A, B. *Cercospora beticola* Sacc., on mangel wurzel. A, Fragment of mangel leaf with large round patches of the fungus. B, Filaments bearing long, many-celled spores; magnified 150 times (see page 261).

A, C—E. *Uromyces Betae* Pers., on mangel wurzel. A, Mangel leaf showing the small, dark spots of the fungus. C, The fungus bursting through the skin of the leaf; magnified 75 times. D, A uredo-spore, and E, a teleuto-spore; both magnified 120 times (see page 261).

F—K. *Pseudopeziza Trifolii* Fuckel, on clovers and lucerne. F, Leaf of red clover spotted with the fungus. G, Portion of the leaf, somewhat enlarged. H, Two sacs (asci) showing the contained spores; magnified 250 times. K, Four spores; magnified 350 times (see page 260).

L, M. Scab disease of potato. L, Cells of the potato containing the bacteria; magnified 150 times. M, Bacteria; magnified 750 times (see above).

N—R. *Erysiphe Martii* Lev., on clover. N, Leaf of red clover showing the light-coloured patches which have been attacked by the fungus. O, Fruit of the fungus, and P, section of a fruit; both magnified 75 times. Q, Two asci containing spores, and R, separate spores; both magnified 250 times (see page 260).

S—U. *Botrytis cinerea* Pers., on cedar. S, Piece of cedar branch with several tufts of leaves killed by the fungus. T, Single leaf with the lower portion killed. U, Fruit-heads of the fungus; magnified 100 times: and below, separate spores; magnified 300 times (see page 266).

W—Y. *Peronospora parasitica* Pers., on wallflower. W, Pods of wallflower attacked by the fungus. X, Fruiting head of the fungus; magnified 160 times. Y, Separate spores; magnified 320 times (see page 269).

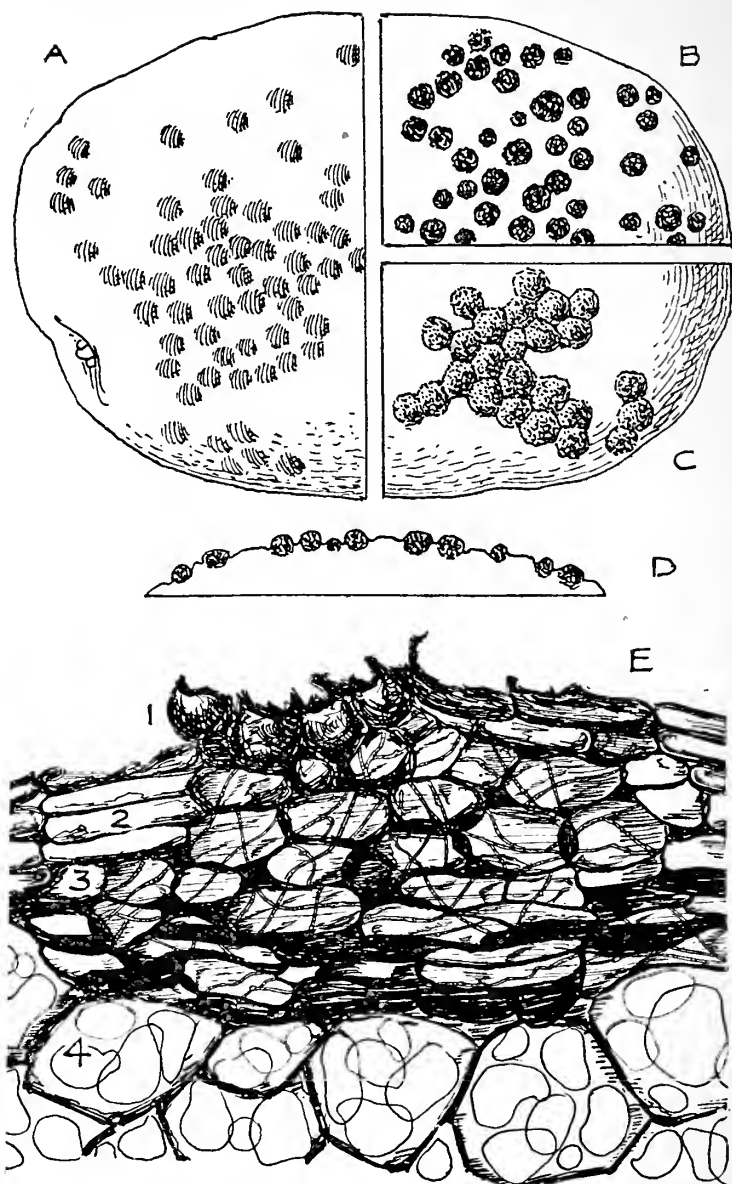


FIG. 2.—Warts on Potato (see Explanation opposite).

is not very serious, as the inside of the tubers remains quite healthy, but it renders the potatoes attacked, through their

rough and rugged appearance, of little value in the market. Scabby potatoes should not under any circumstances be used for "seed," as the disease is sure to reappear in the new crop. The land where these potatoes have been grown should be liberally dressed with gas lime to kill the organisms in the soil, and the cultivation of potatoes should be discontinued for some time.

Potato canker, described in detail and figured in the Report for 1902, has appeared again this year and continues under observation. I may add that this year I found the fungus attacking the roots of the plants themselves and forming the same cankerous growth as on the tuber. I would not advise the use for seed of any of the diseased tubers. Mr. Worthington G. Smith has written a note in the *Gardeners' Chronicle* of October 19, 1904, to the effect that he had cut a potato, affected by this canker, in two, and planted the pieces in an isolated position, with the result that two perfectly healthy plants appeared, and the crop was a heavy one, every tuber being perfectly sound. Happily potato canker is not yet often met with, and it may be exterminated or kept down considerably by not leaving any diseased tubers on the field, but removing or burying them, and growing for some time crops which would not be attacked by this disease.

Fruit trees.—In the early part of the year cases of canker on cherry and apple trees were sent, and the sender informed as to the best methods to prevent a spread of the injury. The canker of fruit trees is caused by a fungus (*Nectria ditissima*), which is, however, considered a wound parasite, that is, a fungus that attacks only tissues previously damaged. These wounds may be due to frost, wet, abrasion by animals, bad pruning, &c. When a wound is observed it should at once be painted with tar, to prevent the spreading of the infection. Old wounds on diseased trees should be cut out with a sharp knife, leaving only healthy tissue, and then painted in the same manner.

Three cases of an attack of the fungus, *Monilia fructigena* Pers.¹ have been reported from different localities. This fungus causes serious injury in orchards through its very

Explanation of Fig. 2.—Warts on Potato (see pages 261 and 264).

A, Half of a potato, showing the size and distribution of the warts. B, Quarter of a potato with the skin pared off, showing the dark-brown patches produced by the fungus. C, Another portion with the skin pared off, showing the patches confluent. D, Section through a portion of a potato, showing the warts penetrating the substance of the potato and raising up the surface of the skin. E, Magnified section through a wart:—1. The cells killed by the fungus being pushed through the epidermis. 2. The epidermal layer. 3. The empty compressed cells full of the mycelium of the fungus. 4. The uninjured cells of the potato containing starch grains.

¹ Journal R.A.S.E., Vol. 63, 1902, pp. 289, 290.

sudden appearance, blighting the buds and flowers almost in a single night. No attacked twig or flower should be allowed to remain on the trees, but these must not be thrown on to a rubbish heap, for the spores are so small that they can be carried about in the air to other trees and thus spread the disease. Different kinds of fruit trees have been known to fall a victim to this parasite. The peach trees in the hothouses of a member in Middlesex, were badly deformed by *Ectoascus deformans* Fuckel, known as "peach leaf curl." This fungus also attacks different fruit trees, specially plums and cherries. It has been described in detail on cherry in the Report for 1901. Another member in Hampshire sent some twigs of a peach tree, from which as many as 75 per cent. of the immature fruits had dropped. It is a frequent occurrence that peach trees drop their fruits, and as no sign of any fungal disturbance in the specimens could be detected, it was suggested that some physical cause had arrested the growth of the peaches, such as sudden changes of temperature, conditions of culture, drought, &c.

Other trees.—A beautiful hundred-year-old cedar in Hertfordshire was in a pitiful state through its smaller branches and leaves being killed. Samples with the injury were applied for and the cause of it was ascertained. The leaves were killed and discoloured, but they still adhered to the branches. No similar attack on the cedar has been observed before. The leaves bore at the base the conidial growth of the fungus, *Botrytis cinerea* Pers. (see Fig. 1, s to v, page 262), the parasitism of which is well known. The fungus had made its entrance through the epidermis at the base of the leaves, where they are still covered with the scales, which protect the leaf buds. These portions, which are much lighter in colour than the other parts of the leaf, remain very tender and soft, and are not able to resist an attack of the fungus, the fine pointed filaments of which pierce their way through and take possession of the inner tissues of the leaves. Consequently most of the leaves were found to be killed at the base, while some of them showed still living tips. When the leaves were completely dead the young twigs succumbed and the aspect of the tree was greatly spoiled. Professor Tubeuf ascribes a similar attack on Douglas fir to a species of *Botrytis*, which he named *B. Douglasii*. It may be that this species is identical with *B. cinerea*, to which I attribute the cause of the disease on the cedar. The member was advised to cut off every diseased branch on his cedar, and to spray the rest of the tree with Bordeaux mixture. This manipulation may spoil the appearance of the tree for a time, but it is the only way to save it.

An interesting case was found of a fungus belonging to the genus *Phoma*, which covered the scales of a cedar cone received from Hampshire. Several species of *Phoma* cause serious diseases, as, for instance, *Phoma Betæ* Fr. on mangel, or *P. Napobrassicæ* Rostr. on turnip. Whether the species observed on the cones is parasitic has not as yet been ascertained, but it is not at all unlikely, as a species of this genus (*P. abietina*) has been described by the late Professor Hartig as attacking and killing silver firs in Germany. It covers the bark of the smaller branches with numerous black pycnidia. The spores of the *Phoma* on cedar were spindle shaped, unicellular, and closely resembled Professor Hartig's species found on the silver fir. Small portions of a diseased Corsican pine were sent from Herefordshire. Some fungoid growth was found adhering to the leaves which was ascertained to be a stage of *Coleosporium Senecionis* Fries. In the first stage of its life the fungus attacks groundsel and other plants of the genus *Senecio*, producing on the leaves and stem small yellow cushions of fungal filaments; these bear small spores (uredospores) which are shed in June. The second stage forms red patches of teleutospores on the same plant. These hibernate, and in spring they produce small sporidia, which germinate on the leaves of pines and form the disease observed in the present case. The mycelium penetrates into the intercellular tissues of the leaves and obtains nourishment there. The spores produced in this stage (æcidiospores) only germinate on groundsel or related species, and then the fungus enters again upon its well-known cycle. By the eradication of all plants of groundsel where pines are thus affected the disease will be arrested.

In March I received from the Society's Zoologist a small twig of a lime tree, which was sent to him by a member from Hampshire, supposing that his trees were infested by *Cryphalus Tiliæ*, recently described by the Zoologist.¹ The twig appeared at first sight to be attacked by this insect. On closer examination it was, however, found that numerous small black fungi had taken possession of the bast layer. As many as 190 fruits (perithecia) of the fungus were counted on an average on a square inch. As the material was insufficient for identification, a visit was paid in April to the locality, and it was found that the injury had hold of all the limes there; and in a churchyard a mile distant it was also observed. Some dead branches with the disease in different stages were taken, and the cause investigated in the laboratory. The black bodies were the fruits of a fungus, called *Valsaria Tiliæ* de-Not., which possesses different forms in its life-history, all of which were found to be present. As, however, this fungus is nowhere

¹ Journal R.A.S.E., Vol. 62, 1900, page 269.

described or recorded as a parasite, but only as living on dead material, it cannot have killed the branches in this case. Experiments with the fungus have been made, and it continues under observation.

Miscellaneous plants.—In three cases diseased cucumbers received from various sources were investigated. The one was a disease causing spots on the leaves, which rapidly increase in size, and kill in time the whole leaf. The spots are caused by the growth of the mycelium of a fungus (*Cercospora Melonis* Cke.) in the tissues of the leaves. All affected leaves should be removed from the plant and a spray of Bordeaux mixture applied. Two samples of cucumber fruits were sent affected by bacteria, causing cumosis, that is, a wet decay of portions of the fruits, which, when completely converted into a wet pulp, drop off. A striking feature on these cucumbers was that the dried up flower still adhered to the fruit. The disease originated from the place of attachment and spread into the fruit. As soon as fruits are seen to be attacked they must be collected and not be allowed to drop, as the bacteria would live in the soil and the disease would reappear. Nothing can be done by spraying to prevent the disease.

Tomato plants have been sent twice; in both cases the fruits and leaves were attacked by *Cladosporium fulvum* Cke., a fungus which causes dark olive-green patches on the mature fruits and renders them unfit for sale or use. The discolouration of the leaves is obvious, but the leaves are seldom completely destroyed. The best method of treatment is to get rid of the diseased material, and this should be removed and burnt. Spraying with Bordeaux mixture is advisable, repeated at intervals, as soon as spots on the leaves are noticed. Plenty of bacteria were observed in the neighbourhood of the diseased patches on the fruits, but they are the consequence and not the cause of the injury.

Cladosporium herbarum Link, causing black spots on pods of kidney beans, has been observed. The fungus is nearly always found on the pods of beans which have been allowed to ripen and dry up on the plants. This species has not been recorded on healthy leaves. All old pods and other material likely to be affected must be removed, else the disease will soon spread.

A member inquired about the nature of a disease which had killed several tulips in his garden in Hampshire. The attack was due to *Botrytis parasitica* Cav., described in detail in the Report for 1900. The diseased tulips should be taken up and burnt and no other tulips be planted for a year or two.

From the same source diseased parsley was sent. It was caused by the fungus *Peronospora nivea* Unger, described and figured in last year's Report. The methods of dealing with the disease were given and a copy of the Report was forwarded to the inquirer. Last year, as reported, this disease made its appearance in various places in Norwood. In one place, a plot where the parsley was completely destroyed in the early spring, the soil was drenched with a 6 per cent. solution of copper sulphate. After a week or two the parsley was sown and a healthy crop was obtained. In a neighbouring locality nothing was done and the disease appeared worse than before, blighting and bleaching the leaves of the whole bed. One morning the bed was sprayed with a 16 per cent. solution of sulphate of iron with the effect that the whole foliage was killed right down to the roots, but after a while the roots sent out new shoots, and the second growth was quite healthy.

A fungus of the same group has been frequently observed this year on the seed pods of stock and wallflowers. It was identified as *Peronospora parasitica* de Bary (see Fig. 1. w to y, page 262), a disease attacking various cruciferous plants. It penetrated the outer skin of the pods and killed the portions underneath, causing swellings and twistings of the pods. Of course no seeds were developed. On searching the neighbourhood of the diseased plants, a common weed (shepherd's purse) was found badly attacked by the same fungus. It is a well-known disease on this plant, and no doubt this was the source whence the infection spread. Care should be taken that no diseased plants of shepherd's purse are permitted to remain. The diseased portions on the cultivated plants must be removed.

Some diseased plants received were found to be attacked by insects and sent on to the Society's Zoologist; and others that had suffered from some physical or mechanical causes, and need not be further referred to.

A communication as to a disease on cucumbers has been received from Professor Mazé, of the Pasteur Institute, Paris, which it is desirable should be published in the Journal. As the disease has been under investigation by my assistant, Mr. Güssow, for some months, he has, at my request, added a note giving the results of his investigations, and a drawing of the fungus.

WILLIAM CARRUTHERS.

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APPENDIX.

Notes on a Disease of Cucumbers. I. By Professor P. MAZE, Pasteur Institute, Paris ; II. By HANS TH. GÜSSOW.

I.

I received in the middle of November last a few cucumber leaves from Hayes, in Middlesex. These leaves, sent by Mr. Bethell, showed many brown irregular spots of various sizes. Leaves so affected perish rapidly. Mr. Bethell says that the disease causes annually a loss of several thousand pounds to the grower.

The damage is brought about by a parasitic fungus whose ramified and septate mycelium spreads in the parenchyma or on the outside of the leaf. The mycelial filaments, of a greenish brown colour, give out many conidiophores which stand erect in the open air and bear each a row of conidia. The latter have the form of an inverted club and are divided into several compartments by transverse partitions. The difference in diameter between the two extremities of the conidium is small, so that the club shape is not very pronounced.

The number of transverse partitions is variable, from one to twelve or fifteen. The outer surface of the conidium is smooth and plain, and presents no constrictions corresponding to the insertion of the partitions; on the contrary the inner surface shows some thickening where the partitions are inserted. I have never seen longitudinal partitions, so that the spores present always one series of compartments or cells.

This fungus thus appears to be a species of *Polydesmus* like the fungus observed by Frank in a disease of pumpkins in the neighbourhood of Berlin.

Cultivated in a pure condition on agar-agar at the temperature of the laboratory, it gives abundant growth and develops very rapidly. At first the mycelium is colourless, but soon it becomes of a greenish brown tinge. The colouring is visible after twenty-four hours, and from this moment the mycelium forms spores similar to those which are observed in the spots on the leaves.

When the culture has attained its full development it presents a thick velvety carpet, forming one body with the substratum. Its colour is of a very dark brown with a slightly greenish tinge. There is a vast abundance of spores covering the whole surface of the mycelium, thus giving it the above noted velvety appearance.

Young spores, taken from such a culture and placed in a fresh agar tube, sprout in six hours at the ordinary temperature of 20°-22° C. (68°-72° F.). The germinative tubes start from the two end cells of the spore; the intermediary

cells have never given out sprouts in my cultivations. After twelve hours the mycelium is visible to the naked eye. As stated above, the brown colour appears after twenty-four hours, when the first spores are formed.

It is easy to imagine the power of dissemination possessed by an organism of this nature and the damage which it may cause under favourable conditions of warm and windy weather.

As a remedy we can recommend only the use of neutral salts of copper, such as sulphate of copper, sufficiently diluted, so as not to burn the leaves. The best preventive measure is to burn all vegetable débris remaining after cultivation, and to turn up the soil in order to bury the spores disseminated on its surface.

P. MAZÉ.

Pasteur Institute, Paris.

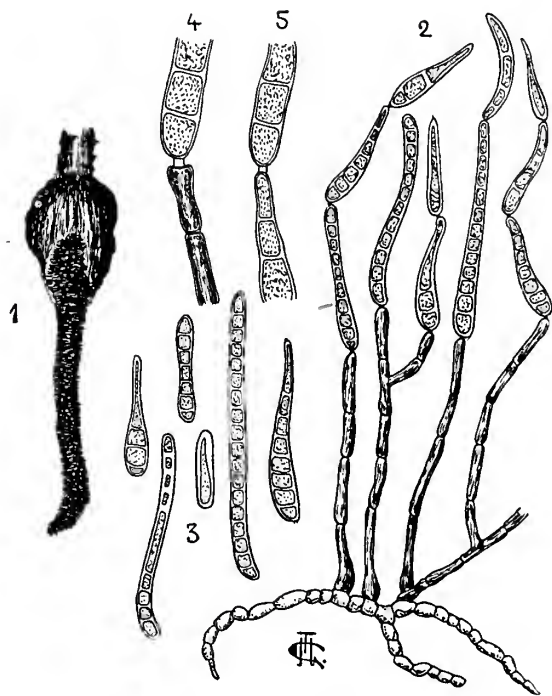


FIG. 3.—Disease of Cucumbers.

1. The fruit attacked by *Corynespora Mazé*, Güssow, $\frac{1}{3}$ natural size.
2. The fungus, magnified 220 times.
3. Spores, various forms, magnified 280 times.
4. Attachment of the spore to the conidiophore, magnified 500 times.
5. Attachment of the spores to each other, magnified 500 times.

II.

On young cucumbers received in June from Worcestershire was observed a thickish dark olive-green carpet of fungal filaments. The sender said that the fruits of all the plants were more or less affected as shown in Fig. 3, 1 (page 271); the portion of the fruit connected with the stalk is still uninjured, whilst the other part is greatly reduced in size and killed by the parasite. The leaves showed in this case no trace of the disease. After careful microscopic examination a drawing was made of the fungus, and it is here reproduced. My observations agree with those of Professor Mazé, and no doubt the two fungi are identical. I found that the spores contained as many as twenty-two divisions and that they adhered to the conidiophores and to each other by a fine and very short filamental tube (see Fig. 3, 4 and 5).

The systematic position of the fungus is amongst the *Hyphomycetes*, and it is nearly related to the genera *Polydesmus* and *Helminthosporium*. In *Polydesmus* the spores are constricted, uniformly club-shaped, and the conidiophores short; whereas in the new fungus the spores are not constricted, are variable in form, and the conidiophores are longer than the spores. In *Helminthosporium* the spores are borne singly, whereas in this fungus they are united in chains. Under these circumstances it must be placed in an intermediate genus, and I propose to name it *Corynespora Mazei*, gen. et spec. nov.

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ANNUAL REPORT FOR 1904 OF THE ZOOLOGIST.

INTRODUCTION.

THE most striking feature in the insect attacks of the past year was the great number of complaints of injury by green fly or blight insects, which seemed to be especially favoured by the prolonged dry weather. All the usual species appeared to be particularly abundant, and some that are seldom recorded made their reappearance; it was noticeable that the air was often full of the winged insects to a degree which attracted the attention of those not especially concerned with their ravages. It has been thought appropriate in the subjoined Report to give a general account of these troublesome insects.

Of the ordinary corn pests only the wheat midge has been inquired about, and this does not seem to have been particularly destructive; but the wireworm and the crane-fly grub, which are general root feeders, have done some damage to corn and other crops. Among insects injurious to fruit trees, the winter moth and the apple-shoot moth have been complained of, and the pear midge has appeared in some new localities. The apple saw-fly also, which seems to be a comparatively rare pest, has been the subject of two inquiries. The apple sucker, which has attracted a good deal of attention of late years, again did considerable damage, though in some cases the less injurious apple aphid seemed to be mistaken for this pest.

An account is given below of the pea midge, an insect which, though capable of doing much harm, does not appear to have been noticed by any of the writers on economic entomology in this country.

A large amount of time and trouble has been expended on the investigation of certain mites of the genus *Tarsonemus*, which appear to be of great importance to nurserymen and horticulturists, and two new species are described below. It has been impossible as yet to carry the research very far, as the cases were only brought to the attention of the Zoologist in the autumn; but an opportunity of continuing the investigation will, it is hoped, occur next year. Meanwhile, the note appended may be of use to other investigators.

TWO INSECTS INJURIOUS TO PEAS.

PEA MIDGE (*Diplosis pisi*).

This is a pest which has attracted no attention in this country, and is not mentioned in any of the books on injurious insects. Curtis, in his *Farm Insects*, figures a pea pod with some of the maggots inside, but says nothing about them except that they are those of "a small fly." Yet cases reported during the past season show that a crop of peas may be practically spoiled by this insect, which probably often occurs, and is very likely confounded with the better known pea moth, an account of which is given below.

Description and Life-history.—The pea midge is a minute fly, with a pale yellow body marked, in life, with dusky bars, which almost disappear soon after death. The two wings have a dark appearance on account of the numerous black hairs with which they are clothed. The insect passes the winter in the mature condition, and lays eggs in the pea blossom. The tiny maggots which hatch out enter the developing pods and almost exactly resemble those of the pear midge, being white and legless, and capable of jumping by applying together the head and tail and separating them suddenly.

The maggots do not bore into the individual peas like the much larger caterpillars of the pea moth, but they feed on their surface and on the lining of the pod, stunting its growth, and giving it a diseased and foul appearance. Externally the pod becomes marked with yellow or white blotches, often greatly distorted; and finally, the wall becomes perforated or splits open, giving exit to the grubs, which distribute themselves over the ground by jumping, and then enter the surface soil to turn into "puparia," or chrysalids, from which the flies come out in about a month.

The actual harm to the peas themselves is slight, and a pod containing numerous maggots may display a row of fairly healthy-looking seeds; but even in this case the insect is a great nuisance on account of the trouble of collecting the peas from the midst of a crowd of repulsive-looking maggots. But the distortion and arrest of growth of the pods are still more serious, and a badly infested row of peas affords so reduced a crop, and this so fouled with maggots, that it is not worth picking.

Treatment.—When the pest occurs in field crops the ordinary rotation is probably a safeguard against the danger of recurrence. It is in the vegetable garden that it is most to be feared, for the flies have not far to go to next year's crop of peas. It is clearly desirable to pick the sound pods as soon

as possible and to remove and burn the plants *at once*, for the pods which remain are pretty sure to be maggoty, and their immediate destruction will remove any future danger from them. But large numbers of maggots will probably have spread themselves already over the ground near the plants, and these will emerge as flies in a few weeks' time unless precautionary measures are taken, and it is therefore advisable to dress the ground with gas lime or some other caustic material as soon as the plants are removed. If these measures are promptly adopted there will be few, if any, of the flies left to renew the attack the following year. In the nature of things there is no remedy for a crop already attacked, as the pest is securely hidden inside the pods, but anything calculated to stimulate the growth of the plants would be sure to diminish the damage done. The worst effects during the past season were on pea plants weakened by the continued dry weather.

THE PEA MOTH (*Grapholitha pisana*).

Cases of considerable injury by this pest were reported during the past summer, and sometimes it was found in company with the pea midge. The insect in this case is a small grey moth, about half an inch across the extended wings. It also lays eggs on the pea blossom, and these hatch out into little yellowish caterpillars, with black heads and brown "neck shields," and with the arrangement of legs usual in caterpillars that are not "loopers"—six true legs in front, and five pairs of suckers farther back. They are much larger than the midge maggots, attaining more than a quarter of an inch in length when full grown. They feed exclusively on the individual peas, boring into their substance till they are entirely hollowed out and surrounded with the excrement of the caterpillar, and in this way they do more harm than the previously mentioned pest when present in large numbers. They also leave the pods and pupate in the ground, and those that mature early emerge as moths the same summer and attack the later varieties of peas. The chrysalids from the later broods remain over till the following spring.

The measures which are recommended for the pea midge would probably be beneficial also in the case of this pest, which is common and widely spread, though only occasionally very destructive.

BLIGHT INSECTS OR PLANT LICE.

APHIDÆ.

From time to time mention has been made in these Reports of one or other of the numerous blight insects which infest our crops. It may be useful to give some account of the

group of Aphidæ as a whole, for various misconceptions are yet prevalent with regard to them, and not a few people still hold the opinion that "blight" is the product of a certain condition of the atmosphere, and attacks all plants indiscriminately, whereas, of course, every aphid comes from an egg or is produced alive by another aphid, and though a few attack a rather wide range of food plants, most confine their ravages either to a single plant or to species which are closely allied. That they sometimes appear with great suddenness and in immense numbers is true, and is accounted for by the peculiarities of their life-history.

Aphidæ, commonly known as green fly, dolphins, plant lice, blight or smother fly, belong to the Order Hemiptera, which also includes the scale insects, the frog hoppers, and various other groups. The two most salient features of insects of this Order are, first, that they feed by sucking and not by biting, and secondly, that there is no great change of form or "transformation" as the young insect grows to maturity. They never exist as grubs or maggots, but the newly hatched young is from the first not greatly unlike its parent.

Perhaps the most curious point about the Aphidæ is that the male insect is rarely met with, and in the case of many species has never yet been discovered at all. In those cases where the males are known they appear, as a rule, only for a short time during the autumn. Probably the most usual life-cycle is this. In autumn males and females appear, and the latter lay eggs which do not hatch till the following spring, when they give rise to wingless females which straightway begin to produce living young. These are all females which in their turn very soon become adult and have broods of their own, and if the circumstances are favourable in a wonderfully short time the plant on which they are feeding will be smothered by myriads of wingless female aphids without a male among them. Obviously there is a limit to this proceeding, for with the failure of the plant starvation would ensue to these inert wingless creatures which have no adequate means of migration. Unfortunately for the agriculturist this contingency is only too efficiently provided against. As soon as the plant is in danger of being inconveniently crowded many of the young aphids begin to grow wings, and these winged females serve to spread the attack, having the instinct to seek out the proper food plant; and it is noteworthy that scarcity or poverty of food seems to stimulate the young insects to form wings, for these winged forms do not occur with any regularity, but are sure to be found when the aphids begin to be overcrowded or the plant fails to afford them sufficient sap. Thus throughout the summer there are several successive

broods consisting entirely of female insects, some wingless and some winged ; but when autumn comes round again a certain number of the young plant lice develop into males, and the life-cycle begins anew. Such is the ordinary type of life-history, but it is often much more complicated, as in the case of the *Phylloxera* of the grape vine, which attacks the roots during one part of the year, while later it produces galls on the leaves, the root-feeding and leaf-feeding forms being entirely different in appearance.

If the under surface of an infested cabbage leaf be examined in the summer, several different kinds of plant lice will seem to be huddled together. In reality there will only be winged and wingless females and their young, but these latter differ from the adult forms in colour and details of structure, and moreover, at each successive moult their appearance is somewhat changed.

Nearly all plant lice are furnished with a pair of tubes or "cornicles" at the end of their body from which the fluid called honey-dew exudes. This substance, which is sometimes so abundant as absolutely to drip from a badly infested plant, greatly adds to the injury caused by sucking the sap, for it entirely chokes up the minute pores on the leaves which are unable to perform their functions. It is this honey-dew which is so attractive to ants, some species of which keep aphids in their nests as men keep milch cattle. Those plant lice which do not possess cornicles nevertheless exude mealy or waxy excretions from the surface of the body. These various excreted substances afford protection to the insects, and account has to be taken of them in selecting an insecticide, for merely watery fluids are readily thrown off, and soft soap or some similar material must be added to an aphid wash to make it adhere to the leaves till it has done its work.

The rate of reproduction varies in different species and under different weather conditions, but it is easy to see that the peculiar life-history of these creatures renders an enormous increase of plant lice possible. It is no unusual state of things for a wingless female to produce twenty young daily, and for these to attain maturity in five days and reproduce in their turn. The rose aphid increases in something like this fashion, and Huxley calculated that taking the weight of a single aphid as the millionth of a grain, the total weight of the tenth brood alone, if all survived, would exceed the weight of the population of China. * Obviously it is possible for vast numbers to be destroyed by rain and by insect foes as they invariably are, and yet for the remnant to be quite sufficient to do very serious harm to the crop they attack ; and, equally obviously, there is no pest among all the various creatures which prey upon our

crops which it is so important to stamp out on its first appearance. Its rate of increase at the beginning is comparatively slow, but it soon attains a speed which is absolutely prodigious; so that the pest appears to have arrived suddenly on a crop where its first occurrence did not attract attention. The attack may, of course, be sudden in reality if swarms of the winged females alight on a crop which was previously free from the pest. This often occurs in the still, heavy atmosphere which precedes a thunderstorm in the middle of summer, and the air is sometimes full of the winged insects, which do not fly actively but drift along on the slight currents, most of them doomed to perish when the storm breaks, while the lucky ones which have succeeded in finding their appropriate plants attain a new feeding ground and spread the attack. This is, no doubt, what is meant when a certain atmospheric condition is spoken of as a "blight." Cases are sometimes reported where rain does not seem to have been particularly beneficial to diseased crops, but these are certainly exceptional. The delicate insects, whether in the air or on the plant, are battered down by myriads and destroyed by the heavy rain, while the plants are at the same time invigorated, and the sudden arrival of wet weather often entirely cures a badly blighted crop. On the other hand the insects are almost always on the under side of the leaves and protected by the wrinkling they have caused as well as by the various materials they exude, so that the disease may recur as actively as ever after the rains.

Again, if the weather is merely warm and damp many species of aphids flourish, but none of them can fail to suffer from downy mildew heavy rain.

Among the influences which prevent plant lice from ever

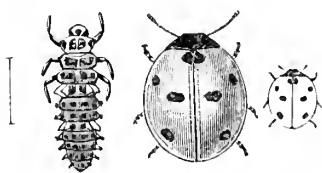


FIG. 1.—Seven-spot ladybird and its larva, enlarged (Natural size indicated).

increasing to more than a very small fraction of the numbers which they would be capable of reaching under favourable circumstances, rain is certainly one of the chief; but fortunately there are many insects which prey exclusively on these pests, and three of them are so common and so effective in destroying green fly that they deserve to be well known and recognised as friends by every farmer. They are the ladybird, the lace-wing fly, and the hover fly. Most people, no doubt, are well acquainted with the ladybird, but astonishingly few recognise its grub, which, after all, is the chief agent in destroying green fly, and it is very often mistakenly complained of as causing injury, being a great deal more conspicuous than the real culprit. It is a slaty-grey grub

with six longish legs, and with yellow spots on its back, and the accompanying figure will perhaps enable it to be identified. The lace-wing fly, or "golden eye," is not so often noticed, and when seen it appears far too fragile a creature to be of much service against green fly. It is of a delicate blue-green colour, with transparent wings much interlaced by veins, while its golden eyes are very conspicuous ; but though a beautiful insect, it is capable of emitting a very disagreeable smell. Its grub is sometimes called the aphid lion on account of the voracity with which it destroys green fly. It is not very unlike a ladybird grub, but is narrower and more pointed in front, and is without the yellow spots on the back. The eggs of these insects are very curious, and are no doubt often seen without their nature being recognised. They are little white bodies at the end

of stalks which, in the common species, are about a quarter of an inch long, and a cluster of them much resembles some large variety of mould. If these eggs are noticed on a plant they ought by no means to be removed. Hover flies, so called from their habit of remaining perfectly stationary in the air over a plant, are two-winged insects, with flat bodies marked with wasp-like yellow bands. When hovering, they are not searching for prey on their own account, but are seeking aphid-infested leaves on which to deposit their eggs. These hatch out into curious, legless, almost transparent grubs, which immediately set to work among the young green fly.

Many ichneumon flies also prey upon aphids, and by all these agencies the pest is generally kept within bounds in a normal season, but in prolonged dry weather, though the insect enemies do their best they are unable to cope with the tremendous rate of increase in the blight, and the plants, deprived of their necessary moisture, are not so well able to resist attack.

A particularly bad year for blight does not seem to make a recurrence of the attack any more likely for the succeeding year. As the green fly multiplies, its parasites, finding abundance of food, increase likewise, and towards the end of the attack may be numerous enough to leave few survivors ; there is therefore little occasion for preventive measures, though

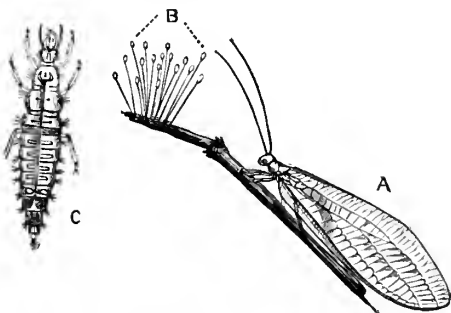


FIG. 2.—A, Lace-wing fly. B, Eggs. C, Larva or grub. (C, after D. Sharp, Cambridge Natural History.)

remedies for the actual attack, if adopted in time, often result in the saving of at least a considerable portion of the crop.

With perennial plants like currant bushes or fruit trees, there is no difficulty in understanding how the pest is able to maintain itself year after year; but the case is different with regard to annuals. What becomes of the insect when the crop—hops or corn or roots—has been removed? It is only in a few instances that we know with any certainty, and in these they either continue to live on weeds more or less closely allied to their food plant, or they migrate to an entirely different plant—as the hop aphid migrates to the sloe—and assume an appearance so different that only careful research has been able to prove the identity of the insect under two distinct forms. In a great many cases we have no knowledge as to where the pest spends the months when

its usual food plant is not in evidence, and can only presume that it has the power of hibernating in the ground and remaining dormant till the crop is again ready for it.

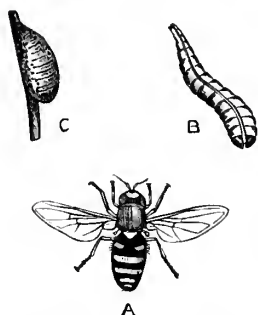


FIG. 3.—A, Hover fly (*Syrphus* sp.). B, Larva or grub. C, Pupa or chrysalis.

Bligh insects may attack any part of a plant. Some feed at the root, like the root form of *Phyllorera vastatrix*, the vine aphid. Others establish themselves on the rough bark of the trunk and branches of trees, like the "American blight," but nearly all those which concern the agriculturist feed on the succulent young shoots or on the leaves, and in the latter case are almost always to be found on the under side of the leaf. This makes their effective treatment by washes rather difficult, and care must always be taken to direct the spray as far as possible so as to strike the leaves from below.

There are numerous aphid washes in the market, and many of them are excellent. For those, however, who prefer to manufacture their own, recipes are here given for two washes which are easily made and generally effective.

A.—Make a "stock emulsion" by dissolving half a pound of soft soap in one gallon of soft water, adding two gallons of paraffin (kerosene) oil, and stirring thoroughly. This stock emulsion must be diluted for use, fifteen gallons of soft water being added to the three gallons of emulsion. Paraffin or kerosene oil is a substance of somewhat uncertain strength as supplied commercially, and it is as well to make a trial of the wash, and to dilute it further if it seems injurious to the foliage.

B.—Boil twelve pounds of quassia chips and add the extract to a hundred gallons of soft water and six or seven pounds of soft soap.

These washes should be used liberally, as their object is to reach and destroy the insects. The case is different with arsenical compounds which are used for poisoning the leaves on which caterpillars feed and which ought, therefore, to be delivered in a fine spray so as to deposit the poison as uniformly as possible on the leaves.

During the past season a great many aphid attacks have been complained of, and now they will be passed briefly in review, a few notes being added in cases where they seem likely to be of use. Nearly all the green flies of agricultural importance belong to the group known as Aphidinae. The American blight or woolly aphid belongs to the Schizoneurinae, while those attacking coniferous trees are mostly of the group Chermesinae.

BLIGHT INSECTS REPORTED AS INJURIOUS IN 1904.

APHIDINÆ.

CORN APHIS (*Siphonophora granaria*).—On leaves and stem of the young plants, and later in the ears. Dusting with lime or soot has been found useful, and stimulating manures should be applied to push on the crop.

STRAWBERRY APHIS (*Siphonophora fragarie*).—This is an extremely rare pest not referred to in any of the books on injurious insects. There are, however, previous instances of its occurrence at long intervals. What becomes of it in those intervals is quite unknown. It may be normally present to an unnoticeable extent—though on the other hand strawberry plants seem remarkably free from blight—or it perhaps maintains its existence on the wild strawberry. Its presence this year is an indication of the extremely favourable conditions for aphid attack.

PEA APHIS (*Siphonophora pisi*, Green dolphin).

HOP APHIS (*Phorodon humuli*).—It is probable that some of the aphids winter on the hop hills, but certainly most migrate in September from the hops to the sloe and to plum trees, especially the damson, when the regular life-history is continued, males and females appearing and winter eggs being laid. These trees, therefore, have to be taken into account in dealing with the hop aphid.

CHERRY APHIS (*Myzus cerasi*).

PEACH APHIS (*Myzus persicæ*).—Found also on the nectarine and sometimes on the apple.

CURRENT APHIS (*Myzus ribis*).—This is the commonest of three species of aphids which infest currant bushes. The tops suffer most, and it is well to cut them off and burn them.

CABBAGE APHIS (*Aphis brassicæ*).

TURNIP APHIS (*Aphis rapæ*).

BEAN APHIS (*Aphis rumicis*; Black Dolphin, Collier, Smother fly).—Attacks at first chiefly the tops of bean plants which it is important to cut off and burn the moment the pest appears. Also found on dock, thistle, and furze, on which last its eggs have been found in great numbers.

APPLE APHIS (*Aphis mali*).—The common green fly of the apple; not to be confounded, as it often is, with the "apple sucker."

PINE APHIS (*Lachnus pini*).—Infesting Scotch fir.

SCHIZONEURINÆ.

WOOLLY APHIS OR AMERICAN BLIGHT (*Schizoneura lanigera*).—This familiar plant louse possesses no cornicles and does not manufacture honey-dew, but the young insects exude streamers of woolly substance from their backs by which they are protected. On account of their situation on the rough bark more drastic measures are permissible than with leaf-feeding aphids. Scraping and scrubbing with strong emulsion is advisable. An alkali wash may be used in winter.

CHERMESINÆ.

SPRUCE BUG (*Chermes abietis*).—Attacks the young shoots, causing cone-like galls.

LARCH BUG (*Chermes laricis*).—Its presence on the larch twigs is indicated by the appearance of a woolly substance like that of American blight. Probably this insect is another form of the spruce bug and has to migrate to the spruce to complete its life-cycle.

THE APPLE SUCKER (*Psylla mali*).

Does not belong to the Aphidæ, but to a group intermediate between the green fly and the frog hoppers, known as the Psyllidæ. Its importance as a pest has only recently been recognised, partly, no doubt, on account of its small size—it is only one-twelfth of an inch in length—and partly from its habit of boring into the young buds, and thus effectually hiding itself. The eggs, which are laid on the shoots, hatch in April, and the young enter the buds, which may be seen to be diseased by the little globules of honey-dew dotting all the neighbouring part of the plant. Many eggs can be removed by winter pruning, the prunings being carefully burnt.

ACARINE PESTS.

Some of the most formidable enemies of the agriculturist do not belong to the group of insects, but to the acari or mites, and several of these creatures were the subject of inquiry during the past season. In previous Reports, instances of alleged injury by members of the usually harmless group of beetle mites (Oribatidæ) have been recorded, and these have again attracted attention. Further investigation shows that the most common offender is not *Oribatu orbicularis*, but the very similar *O. lapidaria*, although in one case the mite complained of turned out to be *Notaspis lucorum*. If these creatures are really injurious they do harm by congregating in large numbers on the bark of trees, especially lime trees, and setting up a sort of cankerous growth which spreads until it covers quite a considerable area. They seem to choose, by preference, the point just below the base of a branch, where they look like a cluster of shining brown eggs; and if a tree is observed to be infested in this manner it would be a wise precaution to remove the mites in some way. The alkali wash, recommended for winter use in my article on "Orchard and Bush Fruit Pests,"¹ would be effectual against this as against other creatures harbouring in the bark.

Some mites occurring in large numbers in daffodil bulbs were sent for identification, and proved to be *Rhizoglyphus echinopus*, a creature of the cheese mite type. It was probably, however, of little importance, and merely an indication of the rotten condition of the bulbs.

The highly destructive mites known as "red spider" were complained of in several districts; but they are, unfortunately, too familiar to require more than a brief notice. The difficulty of eradicating them is chiefly due to two facts—they are protected under the leaves of the plant they infest by the closely interwoven threads which they spin, and their eggs have such tough shells that they resist any insecticide which it is safe to use. It is, therefore, necessary to wash with some fluid—like paraffin emulsion with soft soap added—which will cling well to the leaves, and to repeat the washing at short intervals to kill successive broods.

Another acarine pest now almost universally known is the Black-currant Gall-Mite, which causes "big bud." Several members of the Society have availed themselves of the information obtained by the Zoologist as to localities from which mite-free black-currant plants can be procured; and the number of samples of suspected shoots sent for examination testifies to the interest which has been awakened in this

¹ Journal R.A.S.E., Vol. 63, 1902, page 118.

terribly destructive creature. It is as well to repeat the caution that the few mites on a young plant, which are enough to constitute a future danger, may escape the most careful examination, and that the only real safeguard is the freedom from disease of the parent plant from which the cuttings were taken.

Complaints were received with regard to two other acarine pests which appear to be very destructive in hothouses. They belong to a group of mites with which few people have any acquaintance, and with regard to which the little that has been written is not easily accessible. They are discussed in the succeeding section.

MITES OF THE GENUS *TARSONEMUS* WITH A DESCRIPTION OF TWO NEW SPECIES.

It has been suspected for some time past that mites of the obscure genus *Tarsonemus* are a frequent cause of disease in plants. They are so small and so difficult to investigate that very little attention has been paid to them. There are probably many species, but very few have been described, and about these little is known. It seems likely that many of the diseases to which hothouse plants are subject are due to these mites, and my attention was directed to the matter this autumn by the receipt of two batches of diseased plants from nurseries, the cause of injury in each case being a mite of the genus *Tarsonemus*. It seems important, therefore, to attempt to bring together what is already known about these creatures and to add any facts which have been observed in the cases under notice, though little can be said at present with regard to their treatment.

The Tarsonemidæ constitute a sub-order of the acari or mites—the Heterostigmata. They are very small, averaging, perhaps, the hundred-and-twentieth of an inch in length. The males and females are very different in appearance and might easily be taken for entirely different species. The integument covering the female is divided into plates which overlap, like the slates on a house roof, though these are extremely difficult to make out, and this apparent segmentation is a phenomenon quite unusual in the mite tribe.

In both sexes the first and second pair of legs are directed forward and are widely separated from the third or fourth pairs which are directed backwards. The genus *Tarsonemus* can be recognised at once by the form of the fourth pair of legs. In the female these are extremely thin and weak and end in two long bristles. In the male they are strong clasping organs not used for locomotion at all, but dragged behind the animal as it moves along.

The eggs are comparatively large and hatch out into six-legged "larvæ." These change in turn to eight-legged "nymphs," elongated creatures pointed at either end, and from these emerge the fully formed mites. In September last some injured fern fronds were received from a nursery with inquiries about the "fern mite" which, it was alleged, had made its appearance about two years ago and had since become so serious a pest that some nurserymen had been obliged to give up the fern growing part of their business. Mites were found upon the under surface of the leaves sent, chiefly congregated in the neighbourhood of the veins, and all stages were present, from the eggs to the mature males and

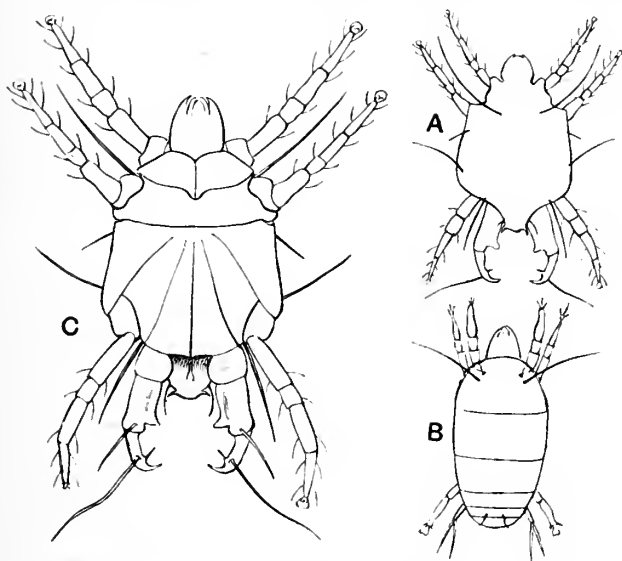


FIG. 4.—A, Male ; B, Female ; magnified about 100 times. C, Under surface of male more highly magnified.

females. They were not, however, clustered together in large numbers as in the case of the gall mites, and their collection and examination was, therefore, a very laborious matter.

Previously known pests of fern plants included thrips, certain beetles, a saw-fly, and a single mite of the "red-spider" group ; but no record could be found of attack by a mite of the genus *Tarsonemus*, to which the specimens examined evidently belonged, though they appeared to differ distinctly from all hitherto described species. I therefore name it—

Tarsonemus tepidariorum, n. sp.

Female : long-oval, rounded posteriorly, and white or faintly yellow in colour, about .2 mm. in length. It differs little from the female of *T. floricolus*,

but the spots from which the balloon-like sensory hairs arise (*clavæ stigmaticæ* of Canestrini) are yellow, and there are two short stout bristles above the posterior end of the body, directed backwards. Male: yellow and sub-triangular, being broadest about the level of the third pair of legs. The posterior part of the body is, however, produced into an elevated process, abruptly truncated and furnished with a pair of stout hooks at the corners. Two strong bristles proceed from the sides of the caudal process. The body is also furnished with several strong and conspicuous bristles (see Fig. 4). The epimera of the third and fourth legs almost reach the transverse line. The second free joint of the fourth leg is highly characteristic, being furnished on its inner side, for three-fourths of its length, with a chitinous expansion which terminates in a prominent blunt process.

In November specimens of a newly introduced greenhouse plant, *Chironia exigera*, were sent for examination, as they were evidently suffering from the attack of some pest. The fleshy leaves were twisted and distorted, and the nodes from which the whorls of leaves proceeded had a brown and decayed appearance. In the neighbourhood of these nodes were found numerous female *Tarsonemus* mites and a large number of eggs. Very few males were found, the season being probably too far advanced. This creature seemed distinct from the foregoing, and I describe it under the name of—

Tarsonemus chironie, n. sp.

Female: long-oval, bluntly pointed behind, and deep yellow in colour. About .24 mm. in length. The spots from which the sensory hairs arise are not pigmented. Male: yellow and sub-triangular. The caudal process is not conspicuous and is rounded, being devoid of the hooks and lateral bristles. The bristles on the body are hardly noticeable. There is a considerable interval between the transverse line and the terminations of the epimera of the third and fourth leg. The second free joint of the fourth leg has a prominence terminating in a short bristle on the inner side near its origin, but continues thereafter of nearly uniform thickness to its termination.

In searching for analogous cases of disease in other plants, I came across some notices of a "begonia mite" in horticultural publications, and was anxious to see if it belonged to either of the species above described. I obtained several specimens of begonia leaves said to be diseased, but could find no mite upon them, though a few eggs were present. The attack was apparently over for the year. I gather that it is a *Tarsonemus*, but it does not appear to have been definitely identified or described, and its more accurate investigation must be deferred for a few months.

As far as I have been able to ascertain, seven species of *Tarsonemus* have been described hitherto, and it may be useful to enumerate them here.

1. *T. floricolus* Canestrini and Fanzago, *Atti del. Soc. Veneto-Trentina di Sci. Nat.*, Vol. 5, 1876, said to have been found on the leaves of a large variety of plants. It may be doubted, however, whether other species have not sometimes been included under this name.

2. *T. kirchneri* Kramer, *Archiv. f. Nat. Jahrg.*, 42, page 199, under the genus *Deudroptus*. This mite was found inside the galls of an *Eriophyes*.

3. *T. buxi* Canestrini and Berlese, *Atti del Soc. Veneto-Trentina di Sci. Nat.*, Vol. 9, page 8, 1884. Found on box leaves.

4. *T. oryzae* Targioni-Tozzetti, *Annali dell'Agricoltura*, Vol. 1, 1878. Found in diseased rice. Male unknown.

5. *T. minusculus* Canestrini and Fanzago, *t.c.* Found on the body of another mite. Male unknown.

6. *T. spirifera* Marchal, *Bull. Soc. Ent. Fr.*, 1902. Found on diseased oat plants.

The *Tarsonemus* mite on the fern is described as being immensely more difficult to get rid of than "red spider," and my correspondent says that he has tried "all the known insecticides and fumigators in commerce" without effect. Carbon bisulphide fumes and hydrocyanic gas have proved powerless against the mite, and this is the more remarkable as the creature is by no means so efficiently protected as is the case with the black-currant gall mite for instance, but it seems to possess extraordinary vitality and tenacity of life. Moreover, it is so small as to be easily overlooked, and for the most part when the plants present a distinctly diseased condition the attack is already over and few if any of the mites are to be found.

Mr. Lynch, Superintendent of the Botanical Gardens at Cambridge, tells me that this is the case with the begonia mite, and that instead of fumigating the obviously diseased plants the only safe way is to fumigate all new plants, though they may appear quite healthy, before introducing them into the houses. In the light which experiments have thrown on the resisting power of the mite to all ordinary insecticides it seems unlikely that even this measure would be entirely successful, but it would at all events stand a better chance when the mites are few in number and the leaves are not dotted with eggs, which are always difficult to kill. Badly diseased plants should be removed and burnt, but it is hoped that further investigation will lead to some way of arresting the disease in its early stages.

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THE WOBURN EXPERIMENTAL STATION OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

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I. FIELD EXPERIMENTS, 1903.

CONTINUOUS GROWING OF WHEAT (*STACKYARD FIELD*), 1903 (27TH SEASON).

THE variety of wheat chosen was grey-chaff Browick, the seed having been obtained from Yorkshire. It was drilled in, 9 pecks per acre, on October 21, 1902, mineral manures being applied the same day to such plots as were to receive them. The seed went in well, and the plant was up on all the plots by

November 10. From the beginning, plot 2a (ammonia salts only) looked very sickly, and the other ammonia salts plots (5, 8a, and 8b) had a poor colour and a bad general appearance.

Farmyard manure, made as usual in boxes, was put on plot 11b, and rape dust on plot 10b, both on February 13, 1903. Frosts occurred about the middle of April and affected the plant to some extent. At that time all the plots looked well except the ammonia salts ones, though even on these the addition of lime (2b) had caused a marked improvement. The nitrogenous top-dressings were applied as usual, the heavier dressings in two lots, April 29 and May 15, the lighter ones on May 15 only. A great deal of rain fell in May, and indeed throughout the season, this being one of the wettest on record. Under these circumstances ripening was very uneven and harvesting greatly delayed. Cutting began on August 19, but was continuously interrupted, and it was not until September 7 that the produce could be all carted and stacked. The plots were very free from "smut" and "rust." The crop returns and valuation are given in Table I., page 290.

The crop generally was considerably below the average, though not as bad as that of 1901, either as regards corn or straw. Notwithstanding the wet season, the straw with one exception (plot 9a) was short. The unmanured produce was 9·5 bushels of corn with 10 cwt. of straw. Nitrate of soda alone increased the yield to 16 bushels, and this was practically the same yield as obtained with the same amount of nitrogen in the form of ammonia salts when lime had been previously applied. As in late years, ammonia salts without lime showed that the land had been rendered "sour," and while there was an increase of crop on this plot as compared with the crops of 1902 and 1901, no doubt this was due in great measure to the heavier rainfall and consequent washing of the land. Between nitrate of soda and ammonia salts when given in moderate amounts with mineral manures there was only about one bushel difference, the wet season probably favouring the use of ammonia salts. But when the nitrogenous salts were used in larger amount (plots 8a and 9a) the bad effect produced by ammonia salts, and noted in the two previous years, was apparent, and it is more than probable that this plot will require liming. On the other hand, nitrate of soda in heavy dressing, together with minerals, produced the highest crop of the season, viz., 34·1 bushels. The next best produce was that of rape cake (10b), it exceeding the farmyard manure plot (11b) by 3 bushels and also giving more straw. In a wet year like the one under review, it was not to be expected that the value of organic materials like rape dust and farmyard manure would tell as much as in a dry season.

TABLE I.—Continuous Growing of Wheat, 1903 (27th Season).

(Wheat grown year after year on the same land, the manures being applied every year.)

Stackyard Field—Produce per acre.

Plot	Manures per acre	Head corn			Tail corn	Straw, chaff, &c.			Value per quarter on basis of 28s	Remarks
		Wght.	No. of bush.	Wgt. per bush.						
		Lb.		Lb.	Lb.	C. q. lb.	s.	d.		
1	Unmanured.	530	8.8	60.0	24	10 1 12	26	9		{ Very poor wheat, small berry, badly matured, not to be compared with plot 7
2a	{ ¹ Ammonia salts (containing 50 lb. ammonia) . . . }	414	7.1	58.0	28	7 0 0	27	0		{ Curious sample of wheat, full average strength, but there is an absence of bloom, and handles very badly
2b	{ Ammonia salts (containing 50 lb. ammonia) with 2 tons lime, December, 1897 . . }	966	16.6	58.0	81	15 3 6	26	0		{ Would have been an average wheat in ordinary seasons; it is badly weathered, contains many sprouted corns, and is in very bad condition
3	{ Nitrate of soda (containing nitrogen=50 lb. ammonia) }	9.5	16.1	59.2	78	18 0 20	27	6		{ Strong wheat, but not well matured; thin in berry
4	{ ² Mixed mineral manures (sulphates of potash, soda, and magnesia, with superphosphate) }	489	8.1	60.6	22	9 0 8	27	6		{ Fair average sample for season; it is not so well grown as plot 7, but better harvested than plot 3
5	{ Mixed mineral manures and ammonia salts (containing 50 lb. ammonia) . . . }	1,352	21.8	61.9	83	18 3 11	28	0		{ Good sound wheat, plump and well harvested
6	{ Mixed mineral manures and nitrate of soda (containing nitrogen=50 lb. ammonia) }	1,249	20.5	60.8	68	21 2 27	27	0		{ Sound, full-berried wheat, plump, not so strong as plot 3
7	Unmanured.	628	10.2	61.5	28	9 2 20	27	6		{ Good sound wheat, not quite so strong as plot 4, but no difference in milling value
8a	{ Mineral manures and (in alternate years, 1903 included) ammonia salts (=100 lb. ammonia) }	1,327	21.3	62.2	48	17 2 6	28	6		{ Coloury, well-grown wheat, stronger than plot 5, being decidedly the strongest wheat in the whole set, and a very nice sample
8b	{ Mineral manures, ammonia salts (=100 lb. ammonia) omitted (in alternate years, including 1903) }	922	14.9	61.5	48	14 0 7	27	9		{ Sound wheat, being an average sample for the season, but it is not so well grown as plot 8a
9a	{ Mineral manures and (in alternate years, 1903 included) nitrate of soda (containing nitrogen=100 lb. ammonia) }	2,062	34.1	60.4	140	37 1 17	27	6		{ Much the same as plot 8b, slightly inferior in growth and colour
9b	{ Mineral manures, nitrate of soda (containing nitrogen=100 lb. ammonia) omitted (in alternate years, including 1903) }	764	12.5	61.0	42	16 0 2	26	9		{ These plots, together with plot 1, were classed as of equal value, all being yellow and without strength
10a	{ 1889, rape cake (=50 lb. ammonia). No manure since }	491	8.1	60.0	36	8 2 6	26	9		
10b	{ Rape cake (=100 lb. ammonia) every year since 1890 }	1,463	24.3	60.1	62	30 1 3	27	0		{ Useful sample, but shows signs of weather
11a	{ 1877-1881, farmyard manure (=200 lb. ammonia). No manure since . . . }	548	9.1	60.0	34	9 2 20	26	6		{ Much better sample than 11b or 2b; yellow, but fair condition
11b	{ Farmyard manure (=200 lb. ammonia) every year . . }	1,281	21.3	60.1	62	27 3 24	25	6		{ Poor, weak, common lot of wheat; bad quality and growth

¹ Ammonia salts are equal weights of sulphate of ammonia and muriate of ammonia.² Mixed mineral manures are, throughout, $3\frac{1}{2}$ cwt. superphosphate of lime, 200 lb. sulphate of potash, 100 lb. sulphate of soda, 100 lb. sulphate of magnesia per acre.

TABLE II.—Continuous Growing of Barley, 1903 (27th Season). 291

(Barley grown year after year on the same land, the manures being applied every year.)

Stackyard Field—Produce per acre.

Plot	Manures per acre	Head corn			Tail corn	Straw, chaff, &c.		Value per quarter on basis of 28s.	Remarks
		Wght.	No. of bush.	Wgt. per bush.					
1	Unmanured.	Lb. 92	1'8	50'0	Lb. 3	c. q. lb. 2 1 6	s. d. 23 6		
2a	{ ¹ Ammonia salts (containing 50 lb. ammonia)	67	1'3	52'0	2	1 1 26	23 6		{ There is practically no difference between plots 1 and 2a; they are unripe, poor quality, green barleys
2b	{Ammonia salts (containing 50 lb. ammonia) with 2 tons lime, December, 1897}	282	5'6	50'0	6	6 2 4	24 0		{ Practically the same as plot 4, but a little greener
3	{Nitrate of soda (containing nitrogen=50 lb. ammonia)}	524	10'2	51'1	28	9 0 14	22 6		{ Without doubt the worst sample; poor, thin, common lot of barley
4	{ ² Mixed mineral manures (sulphates of potash, soda, and magnesia, with superphosphate)}	65	1'25	52'0	1	2 0 10	24 0		{ Inferior sample of barley, with thick skin; badly threshed
5a	{Mixed mineral manures and ammonia salts (containing 50 lb. ammonia)}	69	1'33	52'0	2	1 2 1	24 6		{ This sample is quite as good as plot 7, but has been damaged by rats
5b	{Mixed mineral manures and ammonia salts (containing 50 lb. ammonia), with 2 tons lime, December, 1897}	617	11'5	53'5	14	9 1 2	26 0		{ Better sample than 2b, but has a thick and coarse skin, and shows a lot of weathered corns
6	{Mixed mineral manures and nitrate of soda (containing nitrogen=50 lb. ammonia)}	1,276	24'4	52'1	22	15 3 24	26 0		{ A useful barley, but badly matured
7	Unmanured.	107	2'2	48'0	6	2 1 18	24 6		{ Colour and brightness are not so good as plot 8b, but it is a more even sample than plot 1, and more saleable
8a	{Mineral manures and (in alternate years, 1903 included) ammonia salts (=100 lb. ammonia)}	359	6'9	50'0	20	5 1 12	25 6		{ Unripe, and greener than plot 6
8aa	{Mineral manures and (in alternate years, 1903 included) ammonia salts (=100 lb. ammonia), with 2 tons lime, December, 1897}	1,323	25'0	52'7	32	15 1 20	28 0		{ Not so plump as plot 9b, being coarser in the skin, and having a green tinge about it
8b	{Mineral manures, ammonia salts (=100 lb. ammonia) omitted (in alternate years, including 1903)}	163	3'1	52'0	4	2 0 24	25 0		{ Poor lot of barley, having thick skin, and shows signs of weather
8bb	{Mineral manures, ammonia salts (=100 lb. ammonia) omitted (in alternate years, including 1903), with 2 tons lime, December, 1897}	747	14'2	52'0	24	8 0 20	30 0		{ Second best in set, and runs plot 11b very close, being well bodied, with a good skin; it is well above the average, but unfortunately has been cut too close in the threshing
9a	{Mineral manures and (in alternate years, 1903 included) nitrate of soda (containing nitrogen=100 lb. ammonia)}	2,175	41'6	52'3	36	26 3 20	26 6		{ Same as plot 10a
9b	{Mineral manures, nitrate of soda (containing nitrogen=100 lb. ammonia) omitted (in alternate years, including 1903)}	702	13'4	52'5	14	8 1 24	30 0		{ Very useful lot of barley, but has suffered from weather a little more than plots 11b and 8bb
10a	{1899, rape cake (=50 lb. ammonia). No manure since}	348	6'6	52'0	8	5 1 22	26 6		{ Thinner grains than plots 11a and 10b, and they have all an unripe tinge about them
10b	{Rape cake (=100 lb. ammonia) every year since 1899}	1,451	27'4	53'0	28	13 2 18	27 6		{ Not so kind a sample as 11a, probably not quite so ripe
11a	{1877-1881, farmyard manure (=200 lb. ammonia). No manure since}	644	12'3	52'5	18	7 0 8	28 0		{ Very useful lot of barley; the skin is rather thick and coarse, but the sample shows very few skinned grains, and is generally better threshed
11b	{Farmyard manure (=200 lb. ammonia) every year}	1,332	25'3	52'7	28	14 2 4	31 0		{ Excellent sample of barley; it is mellowier than plots 8bb and 9b, and decidedly the kindest barley in the set; it has the best skin, and is an all-round well-grown barley.

¹ Ammonia salts are equal weights of sulphate of ammonia and muriate of ammonia.

² Mixed mineral manures are, throughout, 3½ cwt. superphosphate of lime, 200 lb. sulphate of potash, 100 lb. sulphate of soda, and 100 lb. sulphate of magnesia per acre.

The valuation of the corn is given in Table I. This was largely affected by the conditions under which the respective crops were gathered in, but, as a whole, the samples were up to the average of the wheats of the district. The best were considered to be plots 8a and 5 (mineral manures and ammonia salts). These gave also the highest weights per bushel.

CONTINUOUS GROWING OF BARLEY (*STACKYARD FIELD*),
1903 (27TH SEASON).

"Standwell" barley, at the rate of 10 pecks per acre, was drilled in on March 20, 1903, and farmyard manure was then spread on plot 11b. Owing, however, to the prevalence of wind, it was not possible to put on the minerals until April 1, nor rape dust until April 8. The plant made its appearance by April 13, except on plot 2a (ammonia salts without lime), where almost nothing came except spurry, and this gradually spread all over the plot. The limed portion (2b) was better, but poor, and on 5a (ammonia salts with minerals, but no lime) there was hardly more barley than on 2a, though spurry was less in quantity. Plots 8a and 8b (the double dressings of ammonia salts with minerals, but no lime) were but little better. On the other hand, plots 5b, 8aa, and 8bb, where ammonia salts had been used, but lime previously applied, were in striking contrast to the unlimed plots, and maintained these appearances throughout, spurry being practically absent on them. Frost coming in April affected the crop considerably, the unlimed plots, however, suffering most. Nitrogenous top-dressings were applied, as with the wheat, on April 29 and May 16. The barley began to come into ear by July 1, but the crop, affected first by frost and then by the continuously heavy rains, was miserably weak. It was not until September 12 that cutting could be begun, but by September 16 all was carried and stacked. The results, together with valuation, are given in Table II., page 291.

The crop returns, it will be seen, were most irregular, for, while on some plots, the unmanured for instance, the result, 2 bushels per acre, was the poorest that has ever been given, on others, such as the farmyard manure (11b) and rape dust (10b), it was fair, and on the minerals and nitrate of soda (heavy dressing) (plot 9a), it was comparatively high, viz., 41.6 bushels. "No manure" and "minerals alone" both gave from 1 to 2 bushels, whereas the very same land had in the year before yielded 25 to 30 bushels. Farmyard manure was slightly inferior to rape dust, but both crops were below the average. Nitrate of soda used alone produced but 10 bushels, and there are indications in this of the yield falling off just as it did previously with ammonia salts; when aided by mineral

manures it gave considerably increased crops, the heavier dressing probably proving more effective in consequence of the heavy rainfall. The crops obtained with ammonia salts alone (2a) and ammonia salts with minerals (5a) are practically negligible, the greater part of the plots having nothing but a covering of spurry; the limed portions (2b and 5b) were better, but more marked was the difference between the heavier dressings of ammonia salts with and without lime (8a, 8b, 8aa, 8bb). From previous applications of farmyard manure (11a) marked benefit was still seen, this plot yielding over 12 bushels, as against the unmanured produce of 2 bushels. The straw throughout was very short, and the only plot giving a fair yield was 9a (minerals and nitrate of soda). As regards the valuation of the corn, the four best lots, at the head of which was farmyard manure, were considerably above the average of the barleys of the district, but the low-yielding plots were much below this, and were very poor samples.

ROTATION EXPERIMENT (*STACKYARD FIELD*), 1903.

Barley having been grown for a number of years in succession, the land necessarily had become a good deal overrun with weeds. It was accordingly decided, now that the plots had become very fairly uniform as regards yield of corn, to take a change of cropping and grow mangels in 1903. It was hoped in this way to give the land a thorough cleaning. Unfortunately, as is now too well known, the constant and heavy wet that prevailed made the year 1903 as bad a one as could be imagined for cleaning land. The common experience was that weeds grew apace, and there was no keeping them down; fields left fallow were as bad as if they had never been touched, and the year's cleaning was practically thrown away. So here, though a crop of mangels was grown, the land was covered with weeds, and the hoped-for cleaning could never be properly effected. During the winter of 1902 and spring of 1903 twitching, ploughing, cultivating, with scarifying and harrowing were done, and on May 13 "Golden Tankard" mangel seed was sown, at the rate of 8 lb. per acre, on all the four rotations (sixteen acres). Horse- and hand-hoeing followed, but it was not until August 1 that the mangel plant could be singled. One cwt. of nitrate of soda to the acre was applied shortly afterwards, but no other manuring was permissible in view of the nature of the proposed inquiry. The crop was ready for pulling on November 12-14, shortly after which date the roots were carted and weighed. The results are given in Table III., page 294.

While no importance attaches to the particular weights recorded, the hoped-for cleaning of the land, owing to the

circumstances stated, was a failure, and it was decided, therefore, to take cleaning crops again for the following year in order to get the land into better condition and tilth.

TABLE III.—*Rotation Experiments, 1903. Mangels.*

Stackyard Field—Produce per acre.

Plot	Manures in 1903	Rotation I.	Rotation II.	Rotation III.	Rotation IV.
		Roots	Roots	Roots	Roots
		T. c. q. lb.	T. c. q. lb.	T. c. q. lb.	T. c. q. lb.
1	{ No manure ¹ (cotton cake plot) . . . }	3 6 3 14	4 5 3 14	5 10 2 14	3 15 1 0
2	{ No manure ¹ (maize meal plot) . . . }	2 4 0 14	2 2 3 14	6 0 0 0	6 5 3 0
3	{ No manure ¹ (artificial equivalent of cotton cake plot). }	3 6 1 0	2 12 3 14	7 6 1 14	4 3 0 0
4	{ No manure ¹ (artificial equivalent of maize meal plot). }	3 2 1 14	3 18 1 14	6 18 1 0	4 5 3 0
5	{ No manure ² (cotton cake plot) . . . }	2 12 3 0	1 18 3 14	2 9 3 14	3 17 3 0
6	{ No manure ² (maize meal plot) . . . }	2 2 1 0	1 7 0 14	3 9 0 0	3 12 2 0
7	{ No manure ² (artificial equivalent of cotton cake dung plot) . . . }	2 3 3 0	0 17 0 0	4 9 3 0	2 3 0 0
8	{ No manure ² (artificial equivalent of maize meal dung plot) . . . }	2 14 3 0	1 2 1 14	2 17 1 14	1 16 0 0

¹ Manured until 1899—once in the rotation—by feeding off roots with decorticated cotton cake and maize meal respectively.

² Unmanured since 1885.

In 1903 all plots top-dressed with 1 cwt. per acre nitrate of soda.

ROTATION EXPERIMENT (*LANSOME FIELD*), 1903.

Wheat followed the beans of 1902 which had been taken when the clover failed. After the bean stubble was ploughed and the land cleaned, grey-chaff Browick wheat was drilled at the rate of 9 pecks per acre on October 22, 1902. This received no manuring; the crop was cut on August 20, 1903, and carted and stacked on August 31. The weights are given in Table IV., page 295. The produce, it will be seen, was very low, being little more than on the continuous wheat plot of Stackyard Field manured with nitrate of soda only (plot 3). Plot 4, which has been noticed before to give abnormal results, was the highest, though unmanured, and no real deduction could be drawn this year. Indeed, the inequalities of the land point to the need of abandoning this as an exact experiment. The valuation of the corn showed the whole to be inferior; the samples were weak and yellow in appearance, being not at all good milling wheats. This was due mainly to the bad weather.

TABLE IV.—*Rotation Experiments on the Comparative Manurial Values of Decorticated Cotton Cake and Maize Meal (Lansome Field).*

Plot	After beans—Manures used for barley only	1903. Wheat—Produce per acre				
		Head corn			Tail corn	Straw, chaff, &c.
		Weight	Bush.	Weight per bush.	Weight	
1	Unmanured plot . . .	C. q. lb. 6 2 16	12.4	Lb. 60.0	Lb. 12	C. q. lb. 15 1 23
2	{ Decorticated cotton cake dung plot . . . }	7 2 12	14.1	60.25	12	14 2 15
3	{ Decorticated cotton cake meal (as top-dressing) plot . . . }	9 3 9	18.3	60.0	10	18 3 20
4	Unmanured plot . . .	10 2 2	19.4	60.5	11	19 3 9
5	Maize meal dung plot . .	9 1 22	17.7	59.75	10	17 0 3
6	{ Maize meal (as top- dressing) plot . . . }	7 1 22	13.9	59.9	13	14 2 25

TABLE V.—*Green-manuring Experiment (Lansome Field).*

Produce of Wheat per acre, 1903.

Plot	Manuring	Head corn			Tail corn	Straw, chaff, &c.
		Weight	Bush.	Weight per bushel	Weight	
		Lb.		Lb.	Lb.	C. q. lb.
1	{ Tares ploughed in, with mineral manures . . }	1,119	17.8	63.0	21	18 1 26
2	{ Tares ploughed in, with- out mineral manures . }	1,146	18.1	63.1	15	19 0 8
3	{ Rape ploughed in, with mineral manures . . }	1,467	23.5	62.5	19	24 0 24
4	{ Rape ploughed in, with- out mineral manures . }	1,206	19.3	62.5	16	17 0 15
5	{ Mustard ploughed in, with mineral manures . . }	2,373	37.9	62.5	30	37 0 8
6	{ Mustard ploughed in, without mineral manures }	1,704	27.4	62.1	21	27 3 16

GREEN-MANURING EXPERIMENT (LANSOME FIELD), 1903.

After the growing and ploughing in (green) of the two crops each of mustard, rape, and tares in 1902, wheat was sown—9 pecks per acre of grey-chaff Browick—on October 22, 1902. The plant came up well, and the crop was throughout better than on the adjoining plots (rotation experiment) of the same

field. The wheat looked better both on the mustard and the rape plots than after the tares, and the experience of previous years was again repeated. Of the two former, the rape at first looked the better, but, later on, the mustard.

The wheat was cut on August 19, 1903, and carried and stacked on August 31. The weights of produce—given in Table V., page 295—quite bore out the appearances shown in the field. The highest yields were given by the mustard plot, the next by the rape, and the lowest by the tares, thus confirming the results of 1899 and 1901. It is noticeable, however, that now, for the first time, there was a marked benefit arising from the use of mineral manures. These results, following on the discussion of last year's figures, leave this experiment a very interesting one, calling for further investigation in view of the fact that the conclusions are the opposite of those to which theoretical considerations would tend. It has been suggested that a single corn crop is not enough to take out, or fully utilise, the nitrogen that has been stored up by the green crops, and so it is proposed to take a second corn crop after this.

CANADIAN WHEATS.—AUTUMN SOWN (*LANSOME FIELD*), 1903; SPRING SOWN (*GREAT HILL*), 1903.

The great attention which has been paid of late to the differences between English wheat and imported wheat, more especially in respect of the "strength"¹ of the latter and its better milling qualities, led to the institution of experiments at the Woburn Farm, simultaneously with those carried on at various other places. These were the outcome of a series of investigations, conducted on behalf of the National Association of British and Irish Millers, by a Committee of the Association, the principal work of which was carried out by Mr. A. D. Hall, M.A., Director of the Rothamsted Experimental Station, and Mr. A. E. Humphries, of Coxes Lock Mills, Weybridge.

The object of the inquiry was to find out how increased "strength," such as is possessed by imported wheats, could be combined with the high produce of home-grown wheat. The immediate purpose in the trial at Woburn was to grow the seed of imported varieties and to ascertain how its yield compared with English wheat on the same class of land, and subsequently to test the milling and baking qualities of the two. A further question arose as to whether the imported wheat should be sown—as usual in this country—in autumn, or else in the spring. Early in 1902 samples of three kinds of Canadian wheat were received from Dr. Saunders, of Ottawa, viz.,

¹ NOTE.—The term "strength" is used to indicate the relative capacity of the flour to make a good loaf of large size. See also page 213 of this Volume.

"Preston," "Red Fife," and "Percy," these being the ones which Dr. Saunders thought most likely to succeed in England. They were grown at the South-Eastern Agricultural College at Wye, in Kent, in 1902, and the seed gathered was distributed to various centres in England, Woburn being one of these. Plots were laid out—six in Lansome Field, and three in Great Hill—for the trial, the soil in each case being light sandy loam (Lower Greensand). Lansome Field was selected for autumn sowing, and each variety was drilled at two different rates per acre, viz., 7 bushels and 10 bushels. In Great Hill the wheats were spring-sown at the rate of 10 pecks per acre. In Lansome Field the wheats followed potatoes, and were drilled in on November 7, 1902. The crops stood the April frosts fairly well; the first to come into ear was "Preston" (June 13), "Percy" following about four days later, and "Red Fife"

TABLE VI.—*Canadian Wheats, 1903.*

Plot	Variety and Seeding per acre	Produce per acre						
		Head corn			Tail corn	Straw, chaff, &c.		
		Weight	Bushels	Weight per Bushel	Weight			
	<i>Autumn sown</i> (Lansome Field)	Lb.		Lb.	Lb.	T.	c.	q.
1	"Preston" 7 pecks .	752	11·8	63·25	14·0	23	3	26
2	" " 10 " .	942	14·7	64·25	20·0	26	3	0
3	"Red Fife" 7 pecks .	1,277	20·0	63·5	34·0	24	1	19
4	" " 10 " .	1,371	21·5	63·5	20·0	29	2	6
5	"Percy" 7 pecks .	612	9·6	63·5	67·0	23	0	9
6	" " 10 " .	694	10·8	64·0	58·0	21	2	9
	<i>Spring sown</i> (Great Hill)							
1	"Preston" 10 pecks .	856	14·1	60·7	13·0	12	0	14
2	"Red Fife" 10 " .	1,248	20·3	61·3	9·0	13	2	18
3	"Percy" 10 " .	844	14·0	60·2	12·5	8	2	20

being still later. Both "Preston" and "Percy" showed a good many "smutty" ears, but "Red Fife" was nearly free from these. "Preston" and "Percy" were cut on August 7, and "Red Fife" on August 11.

In Great Hill the three wheats were sown—after oats of 1902—on March 13, 1903. As in Lansome Field, so here, "Red Fife" was rather later than the other varieties, perhaps some four to five days. Bad weather delayed harvest, and the wheats were cut on August 27. Table VI., above, gives the results of the threshing.

It will be noticed that in each case the "Red Fife" variety gave decidedly the best yield; the "Preston" was next best,

and the "Percy" the poorest. The yield of straw from the "Percy" was also the smallest. As between autumn and spring sowing, there was little to choose as regards yield of corn, but the straw was much more with the autumn sowing. The two fields, it may be said, were much alike as regards fertility. In weight per bushel there was no regular difference, but "Percy" gave rather the most "tail" corn. The comparison of yield with that of English wheat on similar land was hardly an exact one, as, though English wheat was grown side by side, it was not under exactly the same conditions. The weights of wheat (autumn sown) in the green-manuring experiment (see Table V., page 295) may be taken for one comparison, and in Great Hill a plot of "White Monarch" wheat (autumn-sown, however,) gave per acre:—

Head corn			Tail corn	Straw, chaff, &c.
Weight	Bushels	Weight per bushel	Weight	
Lb. 1428	25.1	Lb. 57	Lb. 29.25	C. q. lb. 21 1 13

The last point to be noted is that in Lansome Field the produce from a seeding of 10 pecks per acre was, as a rule, not above $1\frac{1}{2}$ bushels more than that from a seeding of 7 pecks.

The report of the valuer will be read with interest. He remarked generally that the autumn-grown samples were admirable, and handled beautifully, and that he would have been prepared to give half-a-crown a quarter more for these

TABLE VII.—*Canadian Wheats, 1903. Valuation of Corn.*

Plot	Variety	Value per quarter on basis of 28s.		Remarks
		s.	d.	
1	"Preston". (Autumn sown)	29	9	{ An excellent sample of wheat: not quite so strong as plot 5, and skin a little thick; it is not so bright as 5. Shorter berry than other samples, but a fine wheat. One of the best wheats seen, having a beautiful skin, and full of gluten. It is a grand millers' wheat.
3	"Red Fife" (Autumn sown)	29	6	
5	"Percy" (Autumn sown)	30	6	
1	"Preston". (Spring sown)	27	6	{ Colour poor, and not nearly so well grown as the autumn-sown lots.
2	"Red Fife" (Spring sown)	29	0	{ Very little difference between this sample and the autumn-sown one.
3	"Percy" (Spring sown)	28	0	{ Decidedly inferior to the corresponding autumn-sown one.

than for any average sample of wheat of the district. The spring-sown samples were decidedly inferior to the autumn-sown. The details are given in Table VII., page 298.

It will be seen from these results that wheat of a quality considerably superior to average English wheat can be grown quite well in this country, and this, it has to be remembered, is the second year of its growth here. The drawback is the inferiority of yield as compared with English wheat; but it is hoped, by judicious crossing, to be able to secure a wheat having both desiderata of "strength" and yield. Samples of the corn produced were subsequently sent to be reported on as to their milling and baking qualities. The reports will be published at a later date.

LUCERNE (*STACKYARD FIELD*) 1903.

These plots were resown in the spring of 1902, and one cut was taken that year. The manurial applications were given again in 1903, the mineral ones on April 3, and the nitrogenous on May 16. Two cuttings were obtained, the first on August 8 and the second on September 28. The results are given in Table VIII., below. As in the first series, the two plots

TABLE VIII.—*Lucerne (Stackyard Field)*.

Green produce per acre, 1903.

Plot	Manures per acre, applied annually	1903 Green produce ¹			
		T.	c.	q.	lb.
1	No manure	2	7	0	21
2	Superphosphate, 4 cwt.; bone dust, 4 cwt.	2	1	3	5
3	Sulphate of potash, 4 cwt.	1	19	3	2
4	Sulphate of ammonia, 2 cwt.	1	12	1	12
5	Nitrate of soda, 2 cwt.	2	1	3	5
6	{ Superphosphate, 4 cwt.; bone dust, 4 cwt.; sulphate of potash, 4 cwt.; sulphate of ammonia, 2 cwt. }	5	10	2	8
7	{ Superphosphate, 4 cwt.; bone dust, 4 cwt.; sulphate of potash, 4 cwt.; nitrate of soda, 2 cwt. . }	5	13	1	0

¹ Two cuttings.

6 and 7 have given far and away the highest return, and between them there is little to choose. Sulphate of potash alone (plot 3) has not shown any benefit, this result being unlike that of 1901, and the light colour of the crop would seem to indicate the need of some nitrogenous manuring as well.

SAINFOIN (*STACKYARD FIELD*), 1903.

These plots, sown in 1900, were now in their fourth season, and gave two cuttings, the first on June 29, and the second on September 28. No manures were applied to these plots.

TABLE IX.—*Sainfoin (Stackyard Field).*

Green produce per acre, 1903 (fourth season).

Plot	Variety	Green produce per acre								
		First cutting			Second cutting			Total		
		T.	c.	q. lb.	T.	c.	q. lb.	T.	c.	q. lb.
1	English "giant" . . .	5	3	0 14	3	17	2 10	9	0	2 24
2	" " "common" . . .	7	5	1 12	1	13	1 16	8	18	3 0
3	French "giant" . . .	1	19	1 4	1	2	2 10	3	1	3 14
4	" " "common" . . .	3	10	2 4	2	12	0 6	6	2	2 10

The results are given in Table IX., above. In the earlier years (1900, 1901) the "giant" varieties gave the highest return, but in 1902 the English "common" variety yielded best. This has been substantially maintained in 1903, but more marked has been the superiority of both English varieties to the French ones: the latter are becoming much infested with weeds and will probably not last more than another season.

VARIETIES OF CLOVER (*LANSOME FIELD*), 1903.

The comparison of Canadian and American varieties of clover with English ones was continued in 1903. The plots were sown in April, 1902, and the results of the 1903 crop

TABLE X.—*Varieties of Clover (Lansome Field), 1902 and 1903.*

Plot	Variety	Produce of clover hay per acre						Total					
		1902			1903								
		T.	c.	q.	lb.	T.	c.	q.	lb.	T.	c.	q.	lb.
1	Canadian mammoth red	0	13	0	14	2	9	2	0	3	2	2	14
2	Canadian ordinary red	0	19	0	14	3	7	0	14	4	6	1	0
3	English red	1	5	2	0	3	14	2	14	5	0	0	14
4	Minnesota red	0	18	0	0	3	10	3	14	4	8	3	14
5	Wisconsin red	0	17	1	0	3	12	2	16	4	9	3	16
7	Illinois red	0	13	2	0	3	13	0	2	4	6	2	2
8	Indiana red	0	16	2	0	3	18	0	18	4	14	2	18
9	{ English late-flowering red } { (or single cut cow-grass) }	1	5	2	0	3	4	0	26	4	9	2	26
10	Oregon red	0	16	2	0	4	0	2	14	4	17	0	14
11	Chili red	1	2	3	14	4	8	0	2	5	10	3	16
12	English red	1	0	2	14	3	12	1	12	4	12	3	26

are given, together with those of 1902, in Table X., above. There were two cuttings in 1903, the first on June 30, the second on September 4. In the first year the English red

clover took a decided lead, the Chilian variety, of the foreign ones, alone coming near to it. In the second season the Chilian continued to improve, and over the two years gave the best produce of all. The English red clovers also maintained a good position, being, on the whole, second best; while, of the other varieties, the "Oregon red" and "Indiana red" gave good returns. Plot 12 (English red), it should be pointed out, owing to its position, suffered most from the ravages of wood pigeons. It would appear from this experiment that the Chilian red clover, when free from dodder and other weeds which may prove dangerous, is well worth introducing into this country, but it is doubtful if any of the others are likely to prove superior to our own.

EXPERIMENTS ON PASTURE.

1. *Laying Down Land to Grass (Great Hill Bottom), 1903.*

The area under experiment, having been hayed in 1902, was in 1903 grazed all over with bullocks and sheep.

2. *Elliot's Mixtures (Great Hill Bottom), 1903.*

These two plots were also grazed in 1903; they showed very strong growth, and the ground became very well covered, to the exclusion of weeds. The contrast in this respect between these two plots and the rest of the field was very marked, and when bullocks were turned in they showed their decided preference for the "Elliot mixtures." Of course this to a certain extent would be due to the pasture being of more recent laying down. It should be noted, moreover, that chicory was always well eaten down and never was allowed to grow to any height or become stalky. Altogether, the progress of these plots was most satisfactory.

3. *Improvement of Old Pasture (Long Mead and Broad Mead), 1903.*

a. Long Mead.—The plots were chain-harrowed and rolled in the spring, and the manures, having been last applied in 1900, were put on again on April 3, 1903. Subsequently, bullocks, horses, and sheep were grazed in the field.

b. Broad Mead.—This field had been grazed in 1902, and so was hayed in 1903. Chain-harrowing and rolling were done in the early part of the year, and the grass was cut for hay on July 10, the aftermath being grazed. The weights of hay are given in Table XI., page 302.

This was the second year of the experiment, the manurial applications having been made in the winter, 1901-2, and the land grazed in 1902, when plot 2 (superphosphate and sulphate

TABLE XI.—*Grass Experiments (Broad Mead).*

Produce of Hay, 1903.

Plot	Manures per acre	Weight of hay per acre			
		T.	c.	q.	lb.
1	Basic slag, 10 cwt.; nitrate of potash, 1 cwt. . . .	2	0	1	16
2	Mineral superphosphate, 5 cwt.; sulphate of potash, 1 cwt. . . .	2	3	1	24
3	Basic slag, 10 cwt.; sulphate of potash, 1 cwt. . . .	2	1	1	24
4	No manure	1	14	3	0
5	Lime, 2 tons	1	15	0	8
6	Farmyard manure, 12 tons	2	3	3	20

of potash) seemed to be the best eaten, and the dung plot (6) the roughest of all. The hay crop on plot 6 (dung) was, with that from plot 2 (superphosphate and sulphate of potash), the heaviest, the other plots where potash was used in some form also giving increased yields. The lime (plot 5) gave no increase, but undoubtedly had sweetened the herbage. It is worthy of note that in previous experiments conducted in this same field neither basic slag nor superphosphate had shown any benefit, but now that potash was added as a constituent, a decided improvement was shown. This was even more marked than the mere weights of crop would indicate, for, on going over the plots, the botanical differences were strongly evidenced, clover having much increased wherever potash had been applied. Through the kindness and at the suggestion of Mr. A. D. Hall, Director of the Rothamsted Experimental Station, samples of the grass when cut were submitted by him to botanical separation at the Rothamsted laboratory, and the results are set out in Table XII., page 303.

From these interesting figures it will be seen that the application of potash manures has already had a marked influence in increasing the amount of clovers, especially on plot 2, which, taken in conjunction with the weight of hay, has certainly given the best return. Another point brought out is that, though farmyard manure has given a heavy crop, this has been at the expense of the clovers, and consists mostly of the more vigorous grasses. Lime, on the other hand, has increased the clovers and generally sweetened the pasture.

PREVENTION OF POTATO DISEASE (*BUTT FURLONG*), 1903.

A series of experiments on this question, combined with which was a manurial experiment, was carried out on Butt Furlong field in 1903, but, owing to the unfavourable season, the potatoes were a very poor crop, and the crop weighings, though taken, would be misleading, and so are not given. The varieties grown were "British Queen," "Challenge," and

TABLE XII.—*Botanical Analysis of Samples of Hay from Broad Mead Field, 1903.*

Plot	Manures per acre	Percentage composition			Number of species			Total No. of species
		Gramineæ	Legu- minosæ	Other Orders	Gramineæ	Legu- minosæ	Miscel- laneous	
		Per cent. 78.8	Per cent. 15.9	Per cent. 5.3	No. 11	No. 3	No. 9	
1	10 cwt. basic slag; 1 cwt. nitrate of potash .							No. 23
2	5 cwt. mineral superphosphate; 1 cwt. sulphate of potash	67.1	27.0	5.9	9	3	9	21
3	10 cwt. basic slag; 1 cwt. sulphate of potash .	77.5	19.1	3.4	10	2	7	19
4	No manure	86.4	10.9	2.7	8	3	6	17
5	2 tons lime	81.3	15.3	3.4	13	4	9	26
6	12 tons farmyard manure	89.5	8.5	2.0	14	4	7	25

The six most prominent species of each plot—enumerated in order—were as follows :—

- Plot 1. *Agrostis vulgaris*, *Festuca ovina*, *Holcus lanatus*, *Anthoxanthum odoratum*, *Alopecurus pratensis*, *Avena flavescens*.
 " 2. *Agrostis vulgaris*, *Anthoxanthum odoratum*, *Avena flavescens*, *Festuca ovina*, *Holcus lanatus*, *Cynosurus cristatus*.
 " 3. *Agrostis vulgaris*, *Festuca ovina*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Cynosurus cristatus*, *Alopecurus pratensis*.
 " 4. *Agrostis vulgaris*, *Holcus lanatus*, *Festuca ovina*, *Anthoxanthum odoratum*, *Avena flavescens*, *Cynosurus cristatus*.
 " 5. *Agrostis vulgaris*, *Avena flavescens*, *Festuca ovina*, *Holcus lanatus*, *Cynosurus cristatus*, *Anthoxanthum odoratum*.
 " 6. *Agrostis vulgaris*, *Festuca ovina*, *Avena flavescens*, *Anthoxanthum odoratum*, *Cynosurus cristatus*, *Holcus lanatus*.

"Selected Giant." The two former are earlier varieties than the "Selected Giant," but they gave a very poor plant, and the crop was practically done for before spraying could be carried out properly. The "Selected Giant" was the only variety to give a half-decent crop and to show any effects of spraying. The following results are consequently the only ones that call for attention :—

Variety	Treatment	Produce of Tubers per acre													
		Saleable				Pig			Diseased			Total			
		T.	c.	q.	lb.	C.	q.	lb.	C.	q.	lb.	T.	c.	q.	lb.
“Selected Giant” (Manure from high-fed bullocks)	not sprayed	3	11	3	4	16	0	8	8	2	8	4	16	1	20
” ”	sprayed .	4	18	2	8	9	0	12	5	3	16	5	13	2	8
“Selected Giant” (Manure from low-fed bullocks)	not sprayed	2	7	2	20	7	3	2	8	3	10	3	4	1	4
” ”	sprayed .	3	9	0	12	7	2	0	3	0	24	3	19	3	8

In the above the lessening of disease through the spraying, as also the increase of crop, are clearly brought out, just as has been the case in former years.

"FINGER-AND-TOE" IN TURNIPS (*GREAT HILL*), 1903.

In 1903 these experiments were continued and further extended. Hitherto, six plots of ground had been occupied, these including two untreated plots. One of these was now utilised for trying the effect of lime drilled in at the same time as the seed, and a fresh (seventh) plot was added, on which it was decided to give a trial to the new material, "basic superphosphate." Basic superphosphate is ordinary mineral superphosphate, the acidity of which has been neutralised by the intimate mixing with it of finely-divided lime. By its use it is claimed that the ill effects of using an acid manure like superphosphate on land naturally deficient in lime will be avoided, and at the same time the needed addition of lime to the soil will be effected in a ready and convenient manner. In considering the result of the trial instituted in 1903, it has to be borne in mind that a fresh portion of land was taken in for the basic superphosphate plot, this land not having had, like the others, roots grown upon it each successive year for some time past. Accordingly, it was not to be supposed that this new plot would be as badly infected with "finger-and-toe" as the others.

Lime (2 tons to the acre) was applied to plot 2, gas lime (2 tons per acre) to plot 4, and basic slag (10 cwt. per acre) to

plot 5 on December 29, 1902; carbolised lime (2 tons per acre) to plot 7b, and finely-divided lime (2 tons per acre) to plot 7a on December 31. Farmyard manure (at the rate of 12 tons to the acre) was applied to each plot on April 11, 1903, and ploughed in. Swede seed (4 lb. per acre) was drilled on June 24, basic superphosphate (5 cwt. per acre) being applied to plot 1, and lime (2 tons to the acre) to plot 6 at the same time. The swedes were ready for pulling on November 17, and were shortly afterwards taken up, weighed, and sorted into sound and unsound lots, as usual.

The weights are given in Table XIII., below.

TABLE XIII.—"Finger-and-Toe" Experiments on Swedes (Great Hill), 1903.

Produce per acre.

Plot	Applications per acre	Sound roots	Usable roots	Unsound roots	Total weight of roots per acre
		T. c. q. lb.	T. c. q. lb.	C. q. lb.	T. c. q. lb.
1	Basic superphosphate, 5 cwt.	2 2 3 0	1 0 2 8	2 2 20	3 6 0 0
2	Lime, 2 tons	3 6 3 0	0 0 3 24	—	3 7 2 24
3	Nothing	No roots	at all	—	—
4	Gas lime, 2 tons	1 2 2 0	0 6 2 16	0 1 20	1 9 2 8
5	Basic slag, 10 cwt.	—	0 4 1 4	0 3 0	0 5 0 4
6	Lime, 2 tons, drilled in with seed	0 1 0 8	0 8 1 0	—	0 9 1 8
7a	Finely-divided lime	8 3 2 0	0 0 3 12	—	8 4 1 12
7b	Carbolised lime	5 3 2 0	0 1 1 4	—	5 4 3 4

Lime, when applied early, either in the rough state (plot 2), as finely-divided lime (plot 7a), or as carbolised lime (plot 7b), produced crops of nice quality and almost free from disease; the crop from finely-divided lime being much the heaviest. Gas lime, on the contrary, only did moderately well, and basic slag seems to have entirely lost its efficacy in checking disease. On the "nothing" plot there was absolutely not a single root that survived, the land being so much infected with disease, and it is to this cause, too, that is to be attributed, in all likelihood, the failure, in this its first year, of lime when drilled in with the seed (plot 6). This plot had formerly been a "no treatment" plot, and no doubt the lime had not had time to work. Basic superphosphate (plot 1) gave a total crop nearly equal to that of ordinary lime. The number of sound roots on this plot was, however, less, and, as has been already mentioned, the present is the first year of treatment of this particular piece of ground.

RAINFALL AT WOBURN EXPERIMENTAL STATION, 1903.
(292 feet above sea level.)

	Inches	Number of days on which '01 inch or more fell		Inches	Number of days on which '01 inch or more fell
January . . .	2.44	18	July . . .	3.85	15
February67	7	August . . .	3.46	18
March . . .	2.86	18	September . . .	2.13	16
April . . .	1.43	12	October . . .	6.29	26
May . . .	3.23	15	November . . .	1.97	14
June . . .	4.98	9	December . . .	1.16	11
			Total . . .	34.47	179

II. POT-CULTURE EXPERIMENTS, 1903.

THE HILLS EXPERIMENTS.

IN 1902, experiments were conducted on the action of different compounds of manganese on the growth of wheat and barley. The oxides, chloride, iodide, carbonate, sulphate, phosphate, and nitrate of manganese were severally employed. Results of a somewhat striking nature having been obtained as regards the use of the iodide and oxides, it was determined to pursue the inquiry further in 1903.

The iodide, in the case of wheat, retarded germination and gave a much reduced crop, some of the plants not developing at all. Soaking the seed in a 10 per cent. solution of the iodide produced also a very harmful effect, which, however, was not noticed when a 5 per cent. solution was used, while a 1 per cent. solution gave a slight increase of crop. The application of the black oxide of manganese (MnO_2) gave a brown colour to the surface soil and caused it to "cake." With barley the harmful effects of the iodide were not shown, whether this was applied direct to the soil or for soaking the seed; the black oxide, as with wheat, gave the black colour and "caking" of the soil.

1. *The Influence of the Iodides and Oxides of Manganese, Potassium, Sodium, and Lithium on Wheat.*

The seed sown was grey-chaff Browick; earthenware pots were used, and these were in triplicate. The number of seeds sown was twelve in each pot, the plants being subsequently reduced to six in number. In previous experiments the salts used, when soluble, were given dissolved in water. To meet possible objection that the salts were removed beyond the reach of the plant in the early stages, the applications were this time made by mixing the salts in the solid state with the last 4 lb. of earth used in filling the pots. The seeds sown

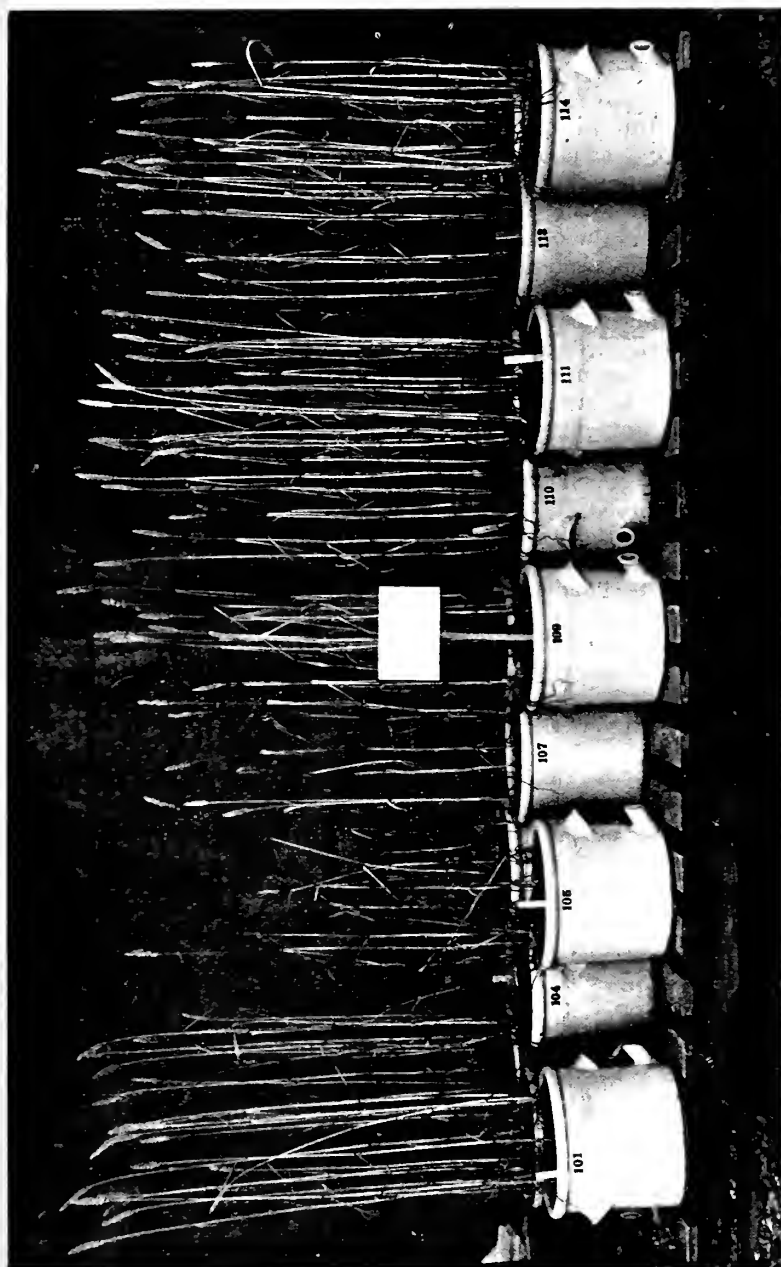


FIG. 1.—Influence of the Iodides of Manganese, Potassium, Sodium, and Lithium on Wheat, 1903.
A, Untreated. B, Manganese Iodide. C, Potassium Iodide. D, Sodium Iodide. E, Lithium Iodide.

were, as usual, selected so as to be as nearly as possible equal in weight, and that there should be the same number of "starchy" and "glutinous" seeds in each pot. The various applications were manganese iodide, potassium iodide, sodium iodide, and lithium iodide, 0.769 grammes of each to a pot—equivalent to 1 cwt. per acre—and of the oxides of the same metals, 1.538 grammes of each to a pot—equivalent to 2 cwt. per acre. The iodide of manganese used was the manganous salt (MnI_2), and the oxide, the red oxide (Mn_2O_3).

The first appearance of note was that where oxide of lithium had been applied, the surface soil became hard and "caked"; still, the young shoots, though kept back at first, forced their way quite well through this, and over the series generally there was very fair germination and no very marked failure. On summing up the germination it was found that, by the end of January, the lowest germination (83.3 per cent.) had been given by the iodide of manganese, the best by the iodide of lithium (100 per cent.). The "caking" of the soil with oxide of lithium continued to be noticed throughout April, 1903, but the plants, though retarded, seemed quite healthy. With iodide of manganese, however, and iodide of potassium, the plants seem to have been affected, they not being nearly so robust as the untreated ones. A month later the whole of the iodide series showed the ill effects of the treatment, the plants turning yellow and looking poor and weakly. The contrast between these and the oxide-treated ones was very marked, the latter all looking well, especially the lithium oxide ones, these coming into ear first. Of the iodide series, the worst was manganese iodide, this lot being very slow in ripening. The measurements of straw and ear were taken early in September, 1903, and the plants were photographed, shortly after which the corn was harvested. The appearances of the plants are indicated by Fig. 1, page 307, and the crop results are given in Table I., page 310.

The differences between the iodide series and the oxide series are very clearly brought out. In every instance of the iodides the results in corn yield came below those of the untreated. As had been indicated during the period of growth, manganese iodide was much the worst, while sodium iodide and lithium iodide were the best, potassium iodide giving a better return than the manganese salt, though still only a half-crop. The only application to affect the straw favourably was sodium iodide, and that not materially.

It may here be recalled that in the experiments of 1902, when the salts were used at the rate of 2 cwt. per acre in solution (and not, as here, in the solid state), manganese iodide had a similarly bad effect, the crop only being a half

one, though other salts of manganese used (oxide, carbonate, sulphate, phosphate, and nitrate) had a negative or, possibly, favourable influence. Putting the results of the two years together, it would appear that it is to the iodine, and not to the metal with which this is combined, that the ill effects are due, and that the iodides generally are harmful, even if applied at the rate of 1 cwt. per acre. As regards the second part of the experiment—that with oxides of the foregoing metals—it has to be observed that in every case the influence was a beneficial one. The salts were used at the rate of 2 cwt. per acre. Lithium oxide, though producing the shortest straw—owing to the early retardation always noticed—gave the highest return both of corn and straw, and it would appear that, though there is at first a “caking” of the surface soil, this has, in the end, no harmful result. Between the oxides of manganese, potassium, and sodium respectively there is little to choose. In previous experiments conducted on wheat in 1901, lithium oxide and potassium oxide were shown to have a beneficial effect, while the experiments of 1902 brought out a like advantage from the use of manganese oxide. The present experiments are therefore—while differently conducted—quite in harmony with the former ones, and the conclusions may therefore be drawn:—

1. That the iodides of the metals manganese, potassium, sodium, and lithium, when used even at the rate of 1 cwt. per acre, have an injurious effect upon wheat, this being most marked with the iodide of manganese.

2. That the oxides of the metals manganese, potassium, sodium, and lithium, when used at the rate of 2 cwt. per acre, have a beneficial influence upon wheat, this being most marked with the oxide of lithium.

2. The influence of the Iodides and Oxides of Manganese, Potassium, Sodium, and Lithium on Barley.

These experiments were conducted almost similarly to those just set out on wheat, the applications being mixed with the top 4 lb. of soil, and not given in solution. The variety of barley used was “Goldthorpe,” sown on April 17, 1903, twelve seeds per pot, the pots being of earthenware and each set in duplicate. After the plants had come up they were reduced to six in each pot. The applications were made in all cases at the rate of 2 cwt. per acre.

Though, with but slight exception, the plants all came up well, very shortly afterwards the whole of the plants treated with iodides began to look sickly and to die away. Where plants did survive, their growth was, as has been noticed before exceptional, owing no doubt to the greater space left for them

through the failure of the other plants. By the middle of July there were only seven plants in the two manganese iodide pots, two in the potassium iodide and sodium iodide series, and four in the lithium iodide pots.

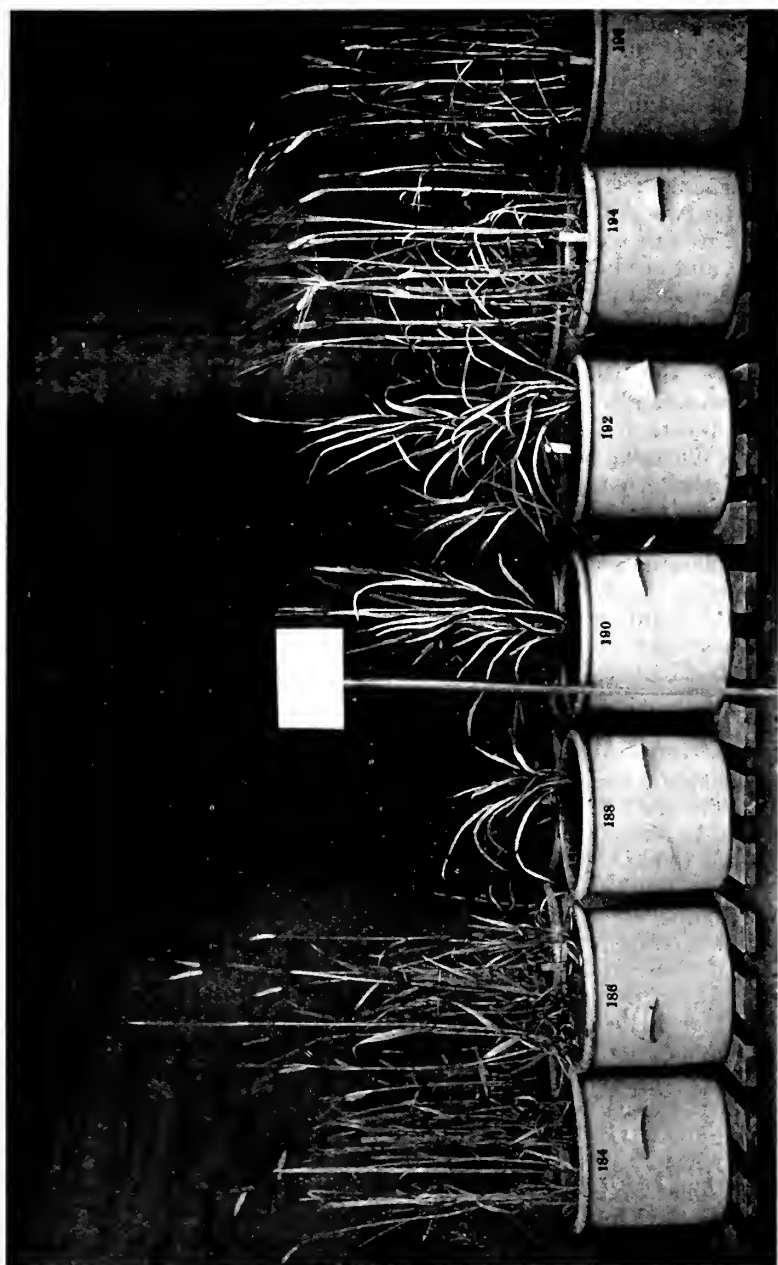
TABLE I.—*Influence of Iodides and Oxides of Manganese, Potassium, Sodium, and Lithium on Wheat, 1903.*

Applications per acre	Length of straw	Length of ear	Weight of corn	Weight of straw
	Inches	Inches	Percent. of untreated	Percent. of untreated
1. Untreated	29·8	2·90	100·0	100·0
2. Manganese iodide (MnI_2), 1 cwt..	23·5	2·77	17·7	67·8
3. Potassium „ 1 cwt. . . .	24·9	2·53	56·4	78·3
4. Sodium „ „ „	27·9	3·00	82·4	107·8
5. Lithium „ „ „	26·0	2·73	76·8	89·2
6. Manganese oxide (Mn_2O_3), 2 cwt.	31·3	2·87	112·0	108·1
7. Potassium „ 2 cwt. . . .	28·9	2·96	119·6	129·0
8. Sodium „ „ „	30·8	2·96	110·6	121·2
9. Lithium „ „ „	25·2	2·90	130·6	143·4

TABLE II.—*Influence of Iodides and Oxides of Manganese, Potassium, Sodium, and Lithium on Barley, 1903.*

Applications per acre	Number of plants	Length of straw	Length of ear	Weight of corn	Weight of straw
		Inches	Inches	Grammes	Grammes
1. Untreated	12	18·0	1·85	16·39	20·75
2. Manganese iodide (MnI_2), 2 cwt.	7	18·2	2·95	14·72	24·17
3. Potassium iodide, 2 cwt. . . .	2	3·4	no ears	none	15·60
4. Sodium „ „ „	2	6·9	one ear only	4·55	29·86
5. Lithium „ „ „	4	6·4	one ear only	2·19	27·62
6. Manganese oxide (Mn_2O_3), 2 cwt.	12	17·2	2·10	12·90	22·12
7. Potassium oxide, 2 cwt. . . .	12	15·8	2·02	13·80	20·80
8. Sodium „ „ „	12	17·0	2·10	15·73	25·19
9. Lithium „ „ „	11	18·2	2·20	13·30	30·62

Meanwhile a marked contrast was shown in the case of the plants treated with the oxides of manganese, &c. In place of failure, there was, as with the wheat, improvement, and all the plants looked healthy and vigorous, more particularly the lithium oxide series; here the leaf was very broad and the tillering out very good. This apparent advantage, however,



A Untreated. B, Manganese Iodide. C, Potassium Iodide. D, Sodium Iodide. E, Lithium Iodide. F, Manganese Oxide. G, Potassium Oxide.

lessened towards the time of ripening. The iodide series were later than the oxide series in ripening, but eventually the measurements of straw and ear were made, photographs taken, and the produce reaped and weighed. The photograph (Fig. 2, page 311), shows the relative appearances of the crops, and the results of the measurements and weighings are given in Table II., page 310.

The two untreated pots were, unfortunately, not regular in their growth, one being, from some reason, better than the other, and producing thirteen ears as against nine; hence, strict comparison as regards produce is not possible.

The iodides have shown, as with the wheat, a decidedly harmful effect, a number of plants having been killed off entirely, and, though in some cases—notably with manganese iodide—a fair return of corn and straw was obtained, this has been due to the abnormal development of one or two plants only. Turning to the experiments of 1902 on barley, it will be found that when manganese iodide, at the rate of 2 cwt. per acre, was used, but in solution, less than half the number of plants came up, though, as now, the actual return derived from the remaining plants was, through their unusual stimulation, by no means small. It may be reasonably concluded, therefore, that the iodide generally cannot be used for barley at the rate of 2 cwt. per acre, at least without producing harm, and that here again the evil effect is due rather to the iodine in combination than to the particular metal.

On the other hand—though, as stated, the figures are not strictly comparable—it would not appear that any harm or any marked good has been the result of treatment with the oxides of manganese, &c. In the case of wheat, it will be remembered, the oxides were productive of some benefit, more especially the lithium oxide. With barley the lithium oxide gave a plant which at one time seemed well in advance of the others, and the yield of straw was decidedly increased, but not that of grain. Lithium oxide produced the same “caking” of top-soil as had been noticed with wheat.

Putting the results together we come to the following general conclusions:—

1. That iodides of manganese, potassium, sodium, and lithium, when applied at the rate of 2 cwt. per acre, are harmful to the barley plant, actually destroying a proportion of the plants grown. The bad effect is more pronounced than with wheat.

2. That oxides of manganese, potassium, sodium, and lithium have no harmful effect on barley, but, on the other hand, are not productive of direct benefit, except, possibly, in the case of lithium oxide.

3. Water-culture Experiments on Barley with the Iodides and Oxides of Manganese and Lithium.

As a complement to the foregoing, a series of experiments in water-culture with the iodides and oxides of manganese and lithium was instituted, chiefly with the view of seeing what influence these salts had on the root-growth of the barley plant. Barley seed was germinated on blotting paper and then transferred to glass cylinders where it was fed with a nutritive solution composed as follows:—

Potassium chloride	. . .	2 grammes.
Magnesium sulphate	. . .	2 "
Potassium phosphate (acid)	. . .	2 "
Calcium nitrate	. . .	8 "
Distilled Water	. . .	6 litres, with a few drops of chloride of iron.

In each of ten cylinders, 1,000 c.c. of the above solution were put, and to them additions were made as follows:—

- 1 and 2 no further addition.
3. .10 grammes Iodide of manganese (MnI_2).
4. .20 " " "
5. .10 " Iodide of lithium.
6. .20 " " "
7. .10 " Oxide of manganese (Mn_2O_3).
8. .20 " " "
9. .10 " Oxide of lithium.
10. .20 " " "

In the case of the insoluble salts, oxide of manganese and oxide of lithium, these were ground up as finely as possible and then added to the cylinders.

The untreated barley plants (cylinders 1 and 2) made good progress, and were strong and healthy; the roots developed quickly, and soon filled the cylinder. With manganese iodide, however, a thin delicate root was produced, but with marked absence of fine rootlets except near the surface. Subsequently there was just the one long tap root, extending three-quarters of the way down the cylinder, with but few side shoots. The stronger the solution was, the more was this shown. After a time the foliage of the plant turned brown, and finally died away altogether. Much the same happened with iodide of lithium, except that here the tap root was thick, but short and stunted, and sent out a fair number of side shoots. The foliage, however, died off after a time, just as it had done with manganese iodide. Manganese oxide, on the other hand, gave a root that showed good growth, with a considerable number of root hairs, these being marked by a fineness not observable in the untreated series. The manganese oxide clung about the rootlets and seemed to be deposited on them. With lithium oxide the root, as with lithium iodide, was thick and stunted, but considerably better in growth than was the case with the

iodide. The plant, with both oxides, grew fairly, though not equal to the untreated, and did not die away as it did with the iodides.

It is clear from this that the iodides of the two metals manganese and lithium have an injurious effect on the roots of the barley plant, this being more marked the stronger the solution is. Further, the oxides do not have this harmful influence, though they do not benefit the plant. The difference between manganese and lithium is also worthy of note, the manganese salts producing a thin, long, wiry root, the lithium salts a thick, short, and stunted one.

MISCELLANEOUS EXPERIMENTS.

"Head" v. "Tail" Corn for Seed Barley.

Experiments conducted in 1901 and 1902 with wheat¹ indicated that there was no advantage to be gained by the selection for seed purposes of the larger and plumper grains as against the smaller or "tail" corn. Preliminary trials with barley, made at the Pot-culture Station, also pointed in the same direction, and it was decided, therefore, to test the question more thoroughly in 1903. In a matter of this kind it is necessary to distinguish clearly between what is meant by "head" corn and what by "tail" corn. In ordinary farming "head" corn means the plump grain separated from the smaller corns and from all weed seeds, &c., by dressing the grain carefully; while the "tail" corn is, speaking generally, all that goes through the screens, and includes not only the small corn, but broken grains, weed seeds, &c. To sow the latter, even in equal quantity by weight, in competition with large plump grain, is not a fair comparison, for the amount of really good seed sown is less, and the young plant has, moreover, to maintain a struggle with the weeds. The true comparison should be between seeds capable of germination, but taking in the one case the large grains and in the other the small grains. This was done in the present instance, and a better description of the experiment would probably be "'large' corn v. 'small' corn." The sample taken was "Standwell" barley, the "large" corn being the "head" corn as obtained direct from the dressing machine, while the "small" corn was obtained by further cleaning of the "tail" corn, using finer sieves and removing the weed seeds and rubbish that generally accompany the "offal" corn. All broken corns were similarly removed till the sample was one of perfectly sound, though "small," corn. Three comparative trials were instituted:—

¹ Journal R.A.S.E., Vol. 63, 1902, pp. 353-356; and Vol. 64, 1903, pp. 353, 354.

- a.* 12 seeds of "head" corn weighing .754 grammes.
b. 12 " "tail" " " .369 "
c. 32 " " " " .754 "

The seed was sown on April 27, 1903, and after the plants had come up, the number of them was reduced in cases *a* and *b* to six plants, while in *c* all the plants, of which there were twenty-eight, were left.

At first the "head" corn (*a*) showed considerably in advance of the others, then came the thick seeding (*c*), but by June 23 there was no difference noticeable between *a* and *b*. With *c*, however, it was clear that there was over-crowding. On July 6, it was noted that the "tail" corn (*b*) had made more progress than the "head" (*a*), and showed longer straw; the thick seeding (*c*) produced a very short straw and poor ear. The several crops ripened and were harvested on September 3.

Table III. gives the principal results:—

TABLE III.—"Head" v. "Tail" Corn for Seed Barley, 1903.

Seeding	Length of straw	Length of ear	Weight of corn	Weight of straw	Percentage of head corn	
	Inches	Inches	Grammes	Grammes	Corn	Straw
<i>a.</i> Head corn (12 seeds sown ¹)	13.6	1.8	7.30	8.87	100	100
<i>b.</i> Tail corn (12 seeds sown ¹)	16.0	2.1	8.70	13.39	119	151
<i>c.</i> Tail corn equal in weight to head corn	13.0	1.1	7.75	10.67	106	120

¹ Subsequently reduced to six plants.

The results go to confirm previous observations, and point to there being no advantage in selecting for seed the bigger and more developed grains in preference to the smaller, provided that the latter be sound and free from weeds, &c. An advantage, indeed, would seem to accrue from using the smaller grains, and this was shown not only in the corn, but in the straw. In the case of the thicker seeding of "tail" corn, though the actual out-turn was an increase over that from "head" corn, there was manifest overcrowding, and the appearances of the plant during growth showed that such thick seeding was not practically advisable.

The general conclusion is drawn that, provided the grains have good germinating power, the smaller grains of barley are just as good, or even better, to sow than the large grains, and, so long as the small grains are unbroken and sound, there is no reason for considering their germination power inferior to that of the larger grains.

J. AUGUSTUS VOELCKER.

FINAL REPORT BY THE CONSULTING BOTANIST AND THE CONSULTING CHEMIST ON THE GRASS EXPERIMENTS CONDUCTED BY THE SOCIETY, 1895—1904.

THE series of experiments on grass land, commenced by the Society in 1895, have been successively reported upon in 1897 and 1900.¹ They were again visited by the Consulting Botanist and the Consulting Chemist in 1904, and are now the subject of this final Report.

The primary object was to ascertain how old pasture land of inferior quality might be improved by manurial applications, or possibly, by renovation. In a few cases the experiments took also the form of laying down land afresh with approved grass mixtures. It was decided that the test of improvement should be not the often misleading one of the weight of hay which the land would produce in any given year or years, but the general character of the pasture at the close of a series of years during which it would be kept under observation and its condition be periodically reported upon.

Different sites were selected, after inspection by the Society's scientific officers, from lands kindly offered for the purpose by Members of the Society. Ultimately, twenty-two sites were chosen, these being situated in eleven different counties of England, and ranging from Durham in the north to Basingstoke (Hants) in the south, and from Ely in the eastern counties to Hereford in the west. A complete list is given on page 317. In this selection nine different geological formations were comprised. In all cases the plots were marked out, but not fenced off, in the selected field, and the treatment to which they were subjected, apart from the manurial applications, was just the same as that which the rest of the field had, so that the experiment was carried out under the ordinary conditions of farming. Out of the twenty-two sites originally taken up, one only (Tabley, Cheshire) has been dropped.

At the outset, samples of the soil were analysed by the Consulting Chemist, the suggestions for manurial treatment being largely based upon the results of the analyses.

It is now our duty to sum up the results of the work and to deduce therefrom such general conclusions as may be rightly formed. For this purpose it will be necessary to deal briefly with each site individually.

¹ Journal R.A.S.E., Vol. 59, 1898, pp. 137-172; Vol. 61, 1900, pp. 116-138.

Grass Experiments.

No.	County	Locality and farm	Field	Owner or occupier	Geological formation	Class of experiment
1	Bedfordshire	Willington, Hill Farm	—	Duke of Bedford (per Mr. C. P. Hall)	Oxford Clay	Laying down pasture
2	"	Amphill, Beckerings Park	—	Duke of Bedford	Lower greensand	"
3	Essex	Hatfield Peverel, Fairstead	—	Lord Rayleigh (per Hon. E. G. Strutt)	London Clay	"
4	Cheshire	Tatton Park	Park	Earl Egerton of Tatton (per Mr. J. T. Smith)	New red sandstone	Manurial and renovation
5	"	Knutsford, Tabley	"Smoker Field"	Mr. Alfred Ashworth	"	"
6	"	Brooksbys, Limber	"Mill Plots"	Mr. William Frankish	Chalk	"
7	Northamptonshire	Stamford, Laxton	"Willow Field"	Mr. James Hornsby	Lias	"
8	"	"	Park	Lord Chesham (per Mr. G. H. Sanday and Mr. W. Calcott)	Loam on chalk	Manurial
9	Bucks	Latimer, Home Farm	Brondfield, No. 2033A	Lord Chesham (per Mr. G. H. Sanday and Mr. W. Calcott)	"	"
10	"	"	No. 2058	Lord Chesham (per Mr. G. H. Sanday and Mr. W. Calcott)	"	"
11	Hants	Basingstoke, Woodgarston	—	Sir F. Bates (per Mr. W. B. Canning)	Clay loam on chalk	"
12	Durham	Bishop Auckland, Binchester Whins	"Bell Hills"	Messrs. Bolekrow, Vaughan & Co. (per Mr. H. G. Burkitt)	Coal measures	"
13	"	Bishop Auckland, Binchester Whins	"Sheep Pasture"	Messrs. Bolekrow, Vaughan & Co. (per Mr. H. G. Burkitt)	"	"
14	"	Bishop Auckland, Binchester Whins	"Wilkinson's Land"	Messrs. Bolekrow, Vaughan & Co. (per Mr. H. G. Burkitt)	"	Manurial and renovation
15	Yorkshire	Barnsley, New Hall	"Low Ing"	Mr. C. Howard Taylor	"	"
16	"	"	"Long Ing"	"	"	"
17	"	"	"Castle Field"	"	"	"
18	Herefordshire	Hereford, Morton Jeffries	—	Mr. Leake (per Technical Education Committee, Hereford County Council)	Old red sandstone	"
19	"	Hereford, Bodenham, England's Gate	Field No. 10	Mr. J. H. Arkwright	"	"
20	"	Hereford, Bodenham, England's Gate	" No. 13	"	"	Manurial
21	Cambridgeshire	Ely, Wilburton, Crow's Farm	—	Mr. Albert Pell	Gault	Manurial and renovation
22	Essex	Hatfield Peverel, Fairstead	—	Lord Rayleigh (per Hon. E. G. Strutt)	London Clay	Manurial

In three cases the experiment concerned the laying down of land to pasture, and this it will be convenient to take first.

A.—LAYING LAND DOWN TO PASTURE.

County	Locality	Formation
1. Bedfordshire	Willington, near Bedford	Oxford Clay
2. "	Beckerings Park, Ampthill	Lower greensand
3. Essex	Fairstead, Hatfield Peverel	London Clay

1. *Willington (Beds).*—Two fields of heavy clay land were laid down in May, 1895, with the following mixture of seeds per acre: 5 lb. *Phleum pratense*, 2 lb. *Poa trivialis*, 7 lb. *Dactylis glomerata*, 6 lb. *Festuca pratensis*, 2 lb. *Alopecurus pratensis*, 3 lb. *Trifolium repens*, $\frac{1}{4}$ lb. *Achillea Millefolium*. This mixture comprised rather over eighteen million germinating seeds, and the total cost per acre was 1l. 0s. 7½d.

Previous to this it had been found in the neighbourhood that grass laid down lasted fairly for from three to four years, but then "went off," and at the time this experiment began the grass land was not reckoned to be worth above 5s. an acre. The Consulting Botanist, visiting the site in 1904, reported that "in both fields the grasses sown have kept hold on the ground, though, from the character of the soil, the vegetation is poor and starved." The fields have, however, in the meantime, passed out of the property of the Duke of Bedford, and are not further available.

2. *Beckerings Park, Ampthill (Beds.), Fields, 296, 297, and 322.*—These fields are on extremely light sandy land; a large area is so poor that it is only used as a rabbit warren. The following mixture of seeds per acre was laid down in each field in a corn crop in 1895: 4 lb. *Phleum pratense*, 2 lb. *Poa trivialis*, 2 lb. *Poa pratense*, 7 lb. *Dactylis glomerata*, 4 lb. *Festuca pratensis*, 3 lb. *Trifolium repens*, 2 lb. *Medicago sativa*, $\frac{1}{4}$ lb. *Achillea Millefolium*—nineteen million germinating seeds in all. Cost, 19s. 11d. per acre.

(a) *Field 296 (Galley Hill).*—After laying down, the field was hayed for three years in succession, and then fed for three years. The hay was very free from weeds and the land well covered with herbage. In 1904 the field was being fed. It had by then formed a really excellent pasture, showing a good undergrowth of white clover and yarrow. Cocksfoot was abundant, but was by no means too coarse or predominant. There was very little lucerne to be seen, but both *Poa pratense* and *Festuca pratensis* were abundant. Yorkshire fog and rye grass had come in, probably blown from the adjacent warren. Weeds, however, were very scarce. The tenant said that the pasture had decidedly improved during the last two years, the clover having increased very much.

(b) *Field 297 (Washbrook Warren).*—This field was never as good as the foregoing one, and, because of its situation, was ploughed up in 1903 and sown with barley for the game. So it may be considered as given up.

(c) *Field 322.*—This has always been grazed. A capital "take" of grasses was obtained and the pasture has been very useful. There is a good bottom of clover and yarrow, and the other grasses sown have persisted.

3. *Hatfield Peverel (Essex).*—This is land on the London Clay. The field was first mole-ploughed and then laid down in April, 1897, with the following mixture per acre : 5 lb. *Phleum pratense*, 2 lb. *Poa trivialis*, 6 lb. *Dactylis glomerata*, 5 lb. *Festuca pratensis*, 2 lb. *Alopecurus pratensis*, 3 lb. *Trifolium repens*, $\frac{1}{2}$ lb. *Achillea Millefolium*—nearly nineteen million seeds, at a cost of 21s. per acre. A dressing of farmyard manure was given in 1898, but since then nothing, and the field has been continuously grazed by milking cows. The seeds sown still hold possession of the land, but the plants are starved and small, and daisies and dandelion have come in very much on the blank spaces. The land clearly wants the help of manure, and it is probable that a dressing of basic slag would be of much advantage.

Conclusions.

From these different experiments it would seem that the mixture of grasses sown has been in each case quite a satisfactory one, and, judging from the previous pasture, a great improvement on the original laying down. But it is equally certain that where, as on the heavy clay land in Essex, there is a stiff impenetrable soil to work on, the addition of manure is necessary in order properly to feed the plant. The success of the laying down on a poor sandy land like that at Ampthill is proof, however, that such grass land could be much improved by laying it down with a proper mixture of grasses and clovers, as was here used.

B.—IMPROVEMENT OF OLD PASTURE.

County	Locality	Formation
4. Cheshire	Tatton Park	New red sandstone

This was old park land; the pasture was composed of little more than common bent grass or twitch (*Agrostis vulgaris*), and it has always been grazed. There is now a most remarkable improvement shown here as the result of using lime. Four tons of lime per acre were applied in the winter of 1895, and the dressing has not been since repeated. Not only has the poor grass been made more palatable to stock, but an entire change has been effected in the spongy mass formed by the creeping stems of the twitch grass. At first there was, and still is on the unmanured plot, a thick matting of these stems,

forming a layer from one to three inches on the surface of the soil. This has now, through the use of lime, the consequent sweetening of the herbage, and the treading of stock, entirely disappeared, the soil of the park now forming the surface, and the roots of the grasses penetrating readily into it; whereas before this the seed falling did not penetrate the mass, and so was prevented from germinating. The good effect of lime is shown even more where farmyard manure has followed the application. Basic slag (5 cwt. per acre) has to a certain, though less, extent had the same effect, and one can quite well see from a distance, because of their fresh and green appearance, the plots where lime or basic slag was applied. Basic slag was tried both in winter and in spring; 5 cwt. per acre have been now applied twice during the term. The autumn application seems to have been rather the better, but in neither case is the improvement as great as with lime. On a portion of the land harrowing and re-seeding were done, but the operation was found very expensive, and, though improvement has been effected, it has not been commensurate with the outlay. It is clear from this experiment that what is needed for this class of land is lime, followed by farmyard manure or cattle-grazing. The benefit of the lime, too, has clearly lasted for nine years.

County	Locality	Formation
5. Cheshire	Tabley ("Smoker Field")	New red sandstone

This experiment was only carried on for two years, but in that time it was clearly shown that the only application to do any good was that of lime. The soil contained only 0.17 per cent. of lime, and was of very poor sandy nature, the herbage, as at Tatton Park, being nearly all *Agrostis vulgaris*. Lime was put on at the rate of 4 tons per acre. Harrowing and re-seeding were tried here, but without success, on account of the thick matting of creeping stems and the dryness of the season when the seeds were sown.

County	Locality	Formation
6. Lincolnshire	Limber, Brocklesby ("Mill Plats")	Light loam on chalk

This was old pasture and a most unpromising area to begin with: yet the result effected by the use of lime has been such as to cause a complete transformation of the field and to raise its value greatly. As at Tatton Park, the one material that has answered is lime, especially when followed by the use of farmyard manure. Wherever lime was applied, the pasture assumed a fresh and green appearance, marking it out from the rest of the field. It could be seen almost to an inch where lime had gone on and where it had stopped, and the influence of the one application of 4 tons of lime to the acre evidently lasted throughout the nine years. Though resting on chalk,

the latter did not come near the surface, and the soil consisted of a light loam resting on clay and, below this, chalk. Analysis showed the top-soil to contain only 0·17 per cent. of lime. The pasture, at starting, was very rough, twitch and Yorkshire fog being the predominant grasses. Harrowing and re-seeding were done on one portion, and this was here fairly successful, though the result was not nearly equal to that from the application of lime. Basic slag was tried, both alone (8 cwt. per acre) and with kainit, but did not prove beneficial; nor did bone meal (4 cwt. per acre). On the lined plots clover increased materially, the matted character of the turf disappeared, and the cattle were constantly seen grazing on these plots.

County	Locality	Formation
7. Northamptonshire	Laxton Park, Stamford ("Willow Field")	Lias Clay

This is land which has been down in grass about fourteen years, and it has been usual to mow it. The soil is a heavy one of very impenetrable character, and it is in this rather than in any deficiencies of soil-constituents that the difficulty lies. Bent grass, Yorkshire fog, crested dogtail, and a little cocksfoot form the main grasses, but all have a starved and stunted appearance, the ground being but thinly covered. Basic slag (8 cwt. per acre), farmyard manure, and a dressing of road scrapings have all been tried, but not one of them has effected any real improvement, and it has been decided to plough up the pasture. The mechanical condition of the soil has, no doubt, had to do mostly with the failure of the pasture, and until one can get plants to penetrate down into the hard clay and so help to open it out and aerate it, little good is likely to follow. Basic slag, if anything, has done the best, but, until the surface can be broken into, little benefit is to be expected from the application of manures.

County	Locality	Formation
8. Northamptonshire	Laxton Park, Stamford (Park)	Lias

This is old park land. The soil is a thin loam resting on clay, and is less stiff than that of Willow Field; the situation also is better, being on a slope. The grasses comprised bent grass, Yorkshire fog, crested dogtail¹, and sweet vernal, together

¹ The following note has been communicated by Mr. Hornsby with reference to the prevalence of crested dogtail:—On the occasion of one of his visits of inspection, the attention of the Consulting Botanist was drawn to a particular pasture in which crested dogtail (*Cynosurus cristatus*) was very abundant. It was obviously not eaten by the stock. Mr. Carruthers advised cutting off the flowering heads before the seeds were formed. This has been done by adjusting the mowing machine so as to cut off the heads of the dogtail above the pasture. After the first year's cutting the dogtail was very much decreased, and after the third year the objectionable grass entirely disappeared. An application of 5 cwt. of basic slag to the acre on the first year of cutting has greatly benefited the grasses and encouraged the growth of white clover, so that now a much improved pasture has been produced.—JAMES HORNSBY.

with large patches of brome grass; clover was practically absent. The land is always grazed. Basic slag (8 cwt. per acre), gas lime (2 tons per acre), farmyard manure, and mineral superphosphate (4 cwt. per acre) have been tried. Basic slag is the one material that has effected an improvement, and of the success of this there is no doubt. Soon after the first application of it white clover made its appearance, and the quantity of this increased from year to year, the basic slag plot standing out clearly from all the others. For quite seven years this improvement was maintained, but now (basic slag not having been renewed) the former clumps of rough grass are beginning to reassert themselves, and a further application of basic slag is desirable. Gas lime succeeded in killing down a lot of the rough grass and in producing a sweeter herbage, better eaten by stock. Neither farmyard manure nor superphosphate effected any continuous improvement. From this experiment and others which, as the outcome, he has carried out on other parts of the park, Mr. Hornsby is of opinion that the influence of basic slag will be felt for about five years, after which it needs renewing. Also he considers that a dressing of 5 to 6 cwt. per acre repeated every fifth year will do as well as the heavier application.

County	Locality	Formation
9. Bucks	Latimer (Broadfield No. 2033a)	Clay loam on chalk

Though resting on chalk, the soil here is rather deficient in lime (0.30 per cent.), as also in phosphoric acid (0.12 per cent.). The pasture is now twenty-five years old, and the herbage is principally hard fescue and bent grass. The best results on this land have followed the application of basic slag followed by kainit, while superphosphate and kainit have also done well, clover coming freely in each case. Lime by itself effected little change, but, as one-half of each plot was limed, it was seen that lime used in conjunction with the other manures certainly did good. Pond mud, salt, and farmyard manure were severally tried, but were quite ineffectual, except that farmyard manure gave rise to strong growth of herbage. A marked improvement has been effected in this field by the use of either basic slag or mineral superphosphate together with kainit. Other experiments have been carried out independently on this farm, and have given rise to a considerable amount of local interest, being frequently visited by parties of farmers. The general outcome has been a decided improvement in the pasture land of the farm through the use of basic slag and kainit. The usual application is one of 4 cwt. per acre of basic slag and 4 cwt. per acre of kainit.

In comparing these results with those on somewhat similar land at Limber, Lincolnshire (Experiment 6), it is interesting

to try and find a reason why in that case lime proved the one remedy, while basic slag or kainit failed to tell except when lime was applied; whereas here, at Latimer, though liming undoubtedly told, yet basic slag and kainit proved quite effectual without it. The soil at Limber was decidedly the lighter in character, being a light loam, whereas at Latimer it was clay loam; it had less lime (0.17 per cent. only as against 0.30 per cent. at Latimer), but it had more phosphoric acid (0.20 per cent. as against 0.12 per cent. at Latimer). From such considerations one might conclude that the Limber soil would require lime the more, but be less dependent than the Latimer soil on phosphoric acid. Also, the heavier character of the Latimer soil would tell in favour of basic slag. As regards the benefit of kainit, the experiments were not conclusive on this point, for neither soil showed on analysis a deficiency of potash, and it was not clear to us that kainit was required at either site. Basic slag was used alone at Latimer at first, and did practically as well as superphosphate with 2 cwt. kainit per acre. The occupier, however, gave a dressing of 4 cwt. of kainit per acre all over the field, as the outcome of what he had noticed elsewhere.

County	Locality	Formation
10. Bucks	Latimer (Field No. 2058)	Clay loam on chalk

This field has been down thirty-seven years in grass; the herbage was poorer than in Broadfield, and clover was almost absent. Hard fescue, bent grass, brome grass, and quaking grass were abundant. The soil differs from that of Broadfield by being much richer in lime (0.91 per cent.), the chalk here coming much nearer the surface; consequently it was not expected that lime would do much good. It had, however, the effect of encouraging a more palatable herbage, but did not largely increase the amount of clover. Pond mud, as also farmyard manure, failed, as on Broadfield, to do any good, but basic slag again was decidedly beneficial. Kainit was tried here, both with basic slag and with superphosphate, but its influence was not clearly marked, the plot with basic slag alone (6 cwt. per acre) being quite as good. The soil here, as on Broadfield, has a fair proportion of potash (0.39 per cent.).

County	Locality	Formation
11. Hampshire	Basingstoke (Woodgarston)	Clay loam on chalk

The site is a field that has been now nearly twenty years under grass. The soil is a heavy clay loam with interspersed flints, the subsoil a heavy reddish-yellow clay. It has abundant lime, but is deficient in phosphoric acid (0.10 per cent.). The herbage was cocksfoot and dogstail principally, with some clover, and patches of brome grass. Farmyard manure, basic slag (8 cwt. per acre), dissolved bones, superphosphate with

kainit, and lime were severally tried. As might be gathered from the heavy nature of the soil and the deficiency of phosphoric acid, basic slag has proved the effectual manure, and the general improvement caused by it has been very marked. Superphosphate (5 cwt. per acre) with kainit (2 cwt. per acre) has also done well, but on soils of this character it is clear that basic slag answers best, and potash is probably not needed. The amount of potash in the soil was 0·36 per cent. Basic slag on this land has undoubtedly done best; trefoil, which originally was present to a large extent, has now been replaced by white clover, while red clover has also increased, and the grasses have become more luxuriant. The second best plot is superphosphate and kainit, the trefoil here also being reduced, and white clover coming. But there is no proof that potash is required. Lime follows in order, and the pasture is to some extent improved, but farmyard manure and dissolved bones have both failed to produce any permanent benefit. In the dry year in which it was first put on, farmyard manure produced the largest crop, but there was little clover in it, and the benefit passed off the second year. Subsequent to the starting of the experiment the whole remainder of the field was manured with basic slag, and this was productive of marked advantage.

County	Locality	Formation
12. Durham	Bishop Auckland ("Bell Hills")	Coal measures

This site has been over twenty years in grass and is usually grazed. The grass is of poor, starved quality, and there is much moss. The soil is a heavy clay loam, resting on the Boulder Clay. Analysis shows it to be rather deficient in lime (0·37 per cent.), but the proportions of phosphoric acid (0·21 per cent.) and of potash (0·45 per cent.) are quite good. Taken as a whole, it may be said that at the end of the period the experimental plots were better than the rest of the field, but, at the same time, there was no one plot that stood out prominently because of its excellence. Lime produced the finest herbage, causing moss and weeds to disappear, and making the herbage more palatable. This plot was the best grazed, but it seemed as if the land wanted further encouragement after the lime. Basic slag had more grass than the lime plot, and this of stronger growth. Farmyard manure had the effect of giving a vigorous growth, and there was almost no clover. On the whole, lime had done best.

County	Locality	Formation
13. Durham	Bishop Auckland ("Sheep Pasture")	Coal measures

This field has been eighteen years in grass, and the soil is much like that of the foregoing site, which is adjacent to it.

It has been once hayed (1903) during the period of experiment, but grazed all other times. There were only three plots marked out, one with 2 tons of lime per acre, a second with 8 cwt. per acre of basic slag, and the third untreated. Both lime and basic slag have effected an improvement, and between them there is not much to choose. On the basic slag plot white clover has come the more thickly, but on the lime plot the grasses have, if anything, become more palatable, and the pasture is perhaps more closely grazed.

County	Locality	Formation
14. Durham	Bishop Auckland ("Wilkinson's Land")	Coal measures

This was a very neglected piece of land in 1895, typical of a great deal of the grass land in the district. Its value when the experiments began could not have been put at more than 1s. an acre. The soil was comprised of a thin black top-soil two and a half inches deep, followed by a mixture of yellowish-red sand and clay with sandy subsoil. Gorse bushes, thorn, bramble, together with rushes, were scattered over it and the grasses were principally twitch and Yorkshire fog, clover being quite absent. The soil was extremely deficient in phosphoric acid (0.06 per cent. only) and also poor in potash (0.13 per cent.) and nitrogen (0.13 per cent.), while lime was by no means abundant (0.37 per cent.). In these respects the soil was vastly inferior to either "Bell Hills" or "Sheep Pasture." The field is always grazed. This has proved a most useful and instructive experiment, as, since the work was taken in hand, the value of the pasture has gone up by fully 7s. 6d. an acre on the best plots. Even more telling is the fact that this site has proved a most instructive "object lesson" to the neighbourhood, and has been much visited, with the result that a good deal of similar land in the district has been treated in a like manner and with most beneficial results. Not long after the work of improvement began, the tenant asked permission to apply basic slag to the rest of the field, and he also treated adjoining fields with it. The different applications tried on this seemingly "waste" land were: basic slag, 8 cwt. per acre; lime, 4 tons per acre; farm-yard manure, 15 loads per acre; bone meal, 4 cwt. per acre; mineral superphosphate, 4 cwt., with kainit, 3 cwt. per acre; and basic slag, 6 cwt., with kainit, 3 cwt. per acre. In addition, one-half of each plot was harrowed and re-seeded. The harrowing was undoubtedly productive of benefit, removing, as it did, a great deal of the rough grass, and this part was better grazed in consequence, though the new grasses hardly made much show. Basic slag (8 cwt. per acre) has undoubtedly effected the greatest good, and on passing to this plot from the untreated area outside it is clearly seen that a complete transformation has been made; the rough clumps of grass have been

almost entirely removed, while clover, of which there was previously no sign, has come thickly, and the pasture is now closely grazed. The plot with basic slag in smaller quantity (6 cwt.) and kainit in addition has not done so well, and it would seem from this that the heavier dressing is advisable. Superphosphate and kainit also, though improving the land, have not been nearly so effectual as basic slag. Lime has undoubtedly done good also, but there is not so much clover. What is observable, however, is that the turf has more improved here than on any of the other plots, the thick matting of creeping stems on the soil surface having entirely disappeared, leaving soil right up to the top. It would seem, however, that—as observed elsewhere—the lime requires following up by farmyard manure or other application. For the first five years or so bone meal showed apparently no benefit whatever, but of late years this has undoubtedly begun to tell, and the plot is closely grazed. Farmyard manure has effected the second best improvement, and this probably on account of the previously poor and starved condition of the soil. The appearance of this plot is perhaps, the freshest and greenest of all, and, though not having the clover of the basic slag plot, it is quite as closely grazed. The turf itself is not improved in the way that of the lime plot is. Commercially the best result has been that from the use of basic slag; then follow farmyard manure and lime.

Altogether this has been a most valuable experiment, with practical results to the benefit of the whole neighbourhood.

County	Locality	Formation
15. Yorkshire	Barnsley ("Low Ing")	Coal measures

Nearly all the herbage of this field consisted of twitch or bent grass; a little cocksfoot was present, but very little clover. There was a matting of creeping stems quite an inch deep above the true soil. This field is generally grazed. The soil is a grey slaty clay with still heavier clay subsoil. The soil contained 0.50 per cent. of lime, with a fair (0.17 per cent.) proportion of phosphoric acid and of potash (0.38 per cent.). The applications tried were: lime, 4 tons per acre; basic slag, 6 cwt., with kainit, 2 cwt. per acre; and bone meal, 4 cwt. per acre. A fourth plot was harrowed and re-seeded. Harrowing did some good by allowing the seed of cocksfoot to get hold of the ground. Bone meal left the land much as it was, but there was a marked improvement both from lime and from basic slag with kainit, clover having come, the growth of grass increased, and the plots being much better grazed. Also in each case the matting of surface stems had almost entirely disappeared, especially after the lime. The limed plot was the better of the two. This field is somewhat wet, and probably because of this the basic slag did well also.

County	Locality	Formation
16. Yorkshire	Barnsley ("Long Ing")	Coal measures

This field differs somewhat from the foregoing. It is on higher and drier land; the soil has considerably less lime (0.27 per cent.), 0.12 per cent. of phosphoric acid, and 0.35 per cent. of potash. The herbage is more wiry, and the matting of surface stems is quite one and a half inches thick. The field is always grazed by milking cows, and a great deal of money had been previously spent on it for cake-feeding, with but little or no benefit to the land. The applications decided on were: lime, 4 tons per acre; basic slag, 8 cwt. per acre; basic slag, 6 cwt., with kainit, 2 cwt. per acre; and bone meal, 4 cwt. per acre. A fifth plot was harrowed and re-seeded. Of this experiment it is sufficient to record that, while re-seeding, bone meal, and even basic slag, have failed to make any marked improvement, a complete and most remarkable change has been effected by the use of lime. It can be seen almost to an inch where the lime has gone, and this plot stands out from all the others by reason of its fresh green appearance and close grazing. Clover is abundant on it, the rough grass has been pushed out, and the cattle are always to be seen on this plot. Further, the thick matting of surface roots has entirely disappeared, and good soil has taken its place. A by no means exaggerated valuation puts the improvement effected at 15s. per acre. This, as the outcome of the application of a single dressing of 4 tons of lime per acre nine years ago, is most remarkable; and so sharp was the distinction between the limed plot and the adjoining one, that a piece of turf two feet square was cut out of the pasture just at the junction of the two plots, and the difference between the limed and the unlimed plots was most clearly discernible, alike in the character of the herbage, the absence or presence of the matting of creeping stems, and in the moister condition of the limed soil, whereas the unlimed soil was dry and parched. This specimen was shown in the Agricultural Education Exhibition at the Park Royal Show in June last and attracted much attention. That lime should have done so much better here than on "Low Ing" is due, no doubt, to the soil being poorer in lime, and it seems clear that where soil is really deficient in lime even basic slag cannot make up for it.

County	Locality	Formation
17. Yorkshire	Barnsley ("Castle Field")	Coal measures

This field is practically a repetition of "Long Ing," showing, as it did, the marked benefit of lime on a soil poor in this constituent. The soil contained only 0.20 per cent. of lime. While basic slag, bone meal, and basic slag with kainit, as also harrowing and re-seeding, have done little good, the limed plot

(4 tons per acre) is full of clover, and is closely grazed. The line of demarcation of the plot is very marked, and it is noticeable, too, that on this plot buttercup and sorrel, both abundant on the other plots, are quite absent.

These experiments at Barnsley form a most valuable and instructive series, and are indeed worth going miles to see.

County	Locality	Formation
18. Herefordshire	Morton Jeffries, Hereford	Old red sandstone

The soil of the field is a rather heavy red clay loam. It has abundant lime (0.82 per cent.), but is poor (0.12 per cent.) in phosphoric acid. The pasture has been down nineteen years. There was a good deal of twitch on it at first, but good grasses were there also, with stunted white clover. The field as a whole has considerably improved since the experiments began, and this improvement is hardly traceable to any one manurial application in particular, but more probably to its better general treatment. The different applications comprised mineral superphosphate, basic slag, bone meal, dissolved bones, superphosphate, and kainit, and one part was also re-seeded. The differences between the plots are not marked, and if any treatment has done better than another it is the use of basic slag (8 cwt. per acre). Clover has decidedly increased here and Yorkshire fog has greatly diminished. The next best plot is that with mineral superphosphate alone (4 cwt. per acre).

County	Locality	Formation
19. Herefordshire	Bodenham (England's Gate, No. 10)	Old red sandstone

This was a field of very poor pasture, now twenty-nine years old, and always grazed, cake, however, not being given. The principal grass was twitch. According to analysis the soil should not be bad, it containing an abundance (3.83 per cent.) of lime, with 0.18 per cent. of phosphoric acid, and 0.54 per cent. of potash. For some reason, however, the explanation of which we cannot supply, the different manurial applications have failed to give any very marked benefit. Lime, as might be expected on such a soil, was not required; bone meal has not told; and though mineral superphosphate (3 cwt., with kainit, 2 cwt., per acre), and basic slag (8 cwt. per acre) have both done good, the effects are not nearly so marked as in other cases. On the whole, basic slag has done best, but even here the effect would seem to be worked out and further application needed. It is more probable, however, that the main fault lies not in the soil-constituents, but in the need of breaking up the soil, and laying it down afresh with suitable seeds.

County	Locality	Formation
20. Herefordshire	Bodenham (England's Gate, No. 13)	Old red sandstone

This is a field which has been allowed to "tumble down" to grass. Twitch, Yorkshire fog, and dogstail are the chief

grasses, and there are patches of gorse, thorn, bramble, &c. The soil differs from that of England's Gate, No. 13 (near by) in being much thinner and in having much less lime (0.36 per cent.); also in being poorer in phosphoric acid (0.12 per cent.). Salt (5 cwt. per acre), dissolved bones (4 cwt. per acre), basic slag (8 cwt. per acre), and lime (4 tons per acre) were tried here. The field, as a whole, has somewhat improved and keeps more stock, but the manurial applications have not done much good. Salt, lime, and bone meal have been ineffectual; and while dissolved bones and basic slag both seemed to benefit the pasture at one time, the influence has now been worked out. This field suffered very badly from drought in the years 1896-1899, and this perhaps prevented the manures from having their proper effect, especially as on other, but wetter, soils in the neighbourhood basic slag has been applied with much success.

County	Locality	Formation
21. Cambridgeshire	Wilburton (Crow's Farm)	Gault

This field was one bearing a miserable stunted pasture with much moss. The soil is a stiff cold clay, water-logged in winter and getting hard and cracked in summer. By analysis it was shown to have plenty of lime (1.33 per cent.) and of potash (0.66 per cent.), but to be deficient (0.09 per cent.) in phosphoric acid. On account of its impenetrable nature it was attempted to improve this by using an "aërating plough" of French design, but this, as well as harrowing and re-seeding, has not been followed with any success. The manurial applications made were: lime, 4 tons per acre; basic slag, 8 cwt. per acre; basic slag, 6 cwt., with kainit, 3 cwt. per acre; and mineral superphosphate, 3 cwt., kainit, 2 cwt., and nitrate of soda, 1 cwt. per acre.

At first the superphosphate, kainit, and nitrate of soda plot showed much the best, owing, no doubt, to the nitrate of soda; but this speedily went down, and the plot is now hardly better than the unmanured one. Lime has made the pasture sweeter, but evidently needs to be followed up by other manure. The result from basic slag, 6 cwt., and kainit, 3 cwt., per acre, is not nearly equal to that from the use of 8 cwt. per acre of basic slag, and it is clear that the larger dressing is needed, for where that has been given a real improvement has been effected. Basic slag has had the result of covering the land with clover, principally white clover. The grasses that are there are good enough, viz., rye grass, cocksfoot, and fescues, but these are at best rather stunted. Yorkshire fog and twitch, however, have largely disappeared. With the application of lime the herbage is not much altered, but the soil is certainly improved, being more opened out and looser, and, if followed up by manure, it would probably show a good result.

County	Locality	Formation
22. Essex	Hatfield Peverel, Fairstead	London Clay

This is a field always grazed by milking cows. The herbage was at first very thin and poor, but the field has, as a whole, decidedly improved. The soil is somewhat deficient in lime (0.30 per cent.), and has only a moderate amount (0.13 per cent.) of phosphoric acid or of potash (0.20 per cent.). Re-seeding with cocksfoot in one case and timothy in another was tried at first, but, owing to the dry season, was unsuccessful. The manurial applications were: basic slag, 8 cwt. per acre; superphosphate, 3 cwt., kainit, 2 cwt., and nitrate of soda, 1 cwt. per acre; lime 4 tons per acre.

Lime has not materially improved the pasture, and superphosphate with kainit and nitrate of soda, though it showed benefit at first, has failed to make any permanent alteration. The basic slag plot, though patchy, is, on the whole, the best, the grasses being most vigorous there, with a good undergrowth of white clover and yellow suckling clover. A further application is probably called for.

GENERAL CONCLUSIONS.

When the several experiments are considered as a whole, it may be fairly claimed that the general result of the inquiry has been to bring out certain definite, if not perhaps new, facts, and to establish the conclusion that a great deal can be done, by proper treatment, to improve old worn-out pastures throughout the country. It may be said that these experiments can, at best, have not much more than local significance, but the selection of the areas was such as to make them typical of large tracts of country, and what has been tried there might with advantage be followed elsewhere. Definite information has also been gained as to the classes of land on which particular manurial agents will work, and as to the length of time the effect of these will last, more particularly lime and basic slag.

Success of the Experiments.—Of the eighteen sites at which manurial experiments have been continuously carried out, at twelve, viz., Tatton Park (Cheshire), Limber (Lincs.), Laxton (Northants) one site, Latimer (Bucks.) two sites, Basingstoke (Hants), Bishop Auckland (Durham) one site, Barnsley (Yorks.) three sites, Wilburton (Cambs.), and Hatfield Peverel (Essex), the treatment the land required was definitely ascertained. At the other six places, viz., Laxton (Northants) one site, Bishop Auckland (Durham) two sites, and Hereford three sites, the results were more or less inconclusive. The nineteenth site (Tabley, Cheshire) was given up after two years, though already then testifying to the value of lime.

Evidence of Chemical Analysis.—A further feature brought out is the correspondence found between what chemical analysis indicated were the principal deficiencies of the soils and what was found by actual trial to be the constituent needed. For instance, in only two (England's Gate, Field No. 13, and Hatfield Peverel) out of the twelve cases in which lime was forecasted as a probable remedy, did its application fail to benefit, and in most instances the benefit was of a very striking character. On the other hand, where analysis showed a sufficiency of lime to be present, its further application in practice never brought much benefit. Again, out of ten cases in which phosphoric acid was found by analysis of the soil to be deficient, in every one of these there was marked benefit derived from the use of either basic slag or mineral superphosphate. It so happened that not one of the soils experimented on was really deficient in potash, and hence the results as regards this constituent are not definite. "Wilkinson's Land" (Bishop Auckland) had the lowest percentage (0.13 per cent.), but even that quantity seemed to suffice. Lastly, as regards nitrogen, it would seem as if this constituent did not so largely enter into consideration in respect of its direct application as manure to the land, since, with the exception of "Wilkinson's Land" (Bishop Auckland), which had only 0.13 per cent. of nitrogen, there was no clear proof of the continued beneficial action of nitrogenous manures. At Wilburton (Experiment 21), the nitrogenous manure was at once assimilated by the plant, and a vigorous vegetation produced. But in the following year, the stimulus of the nitrogenous salts being wanting, the vegetation returned to its normal condition. While mentioning the non-efficiency of nitrogenous manures directly applied, it has, however, to be remembered that in almost every case the pasture was grazed by cattle, and so received their nitrogenous droppings.

Laying Land down to Pasture.—The general conclusions as to laying down of land to pasture have been given earlier (see page 319), and it need only be repeated that it is clear that had land within the last twenty or even thirty years been put down with good and tested seed mixtures, such as those used in Experiments 1, 2, and 3, pastures would not be found in such a bad condition as is now frequently the case. At the same time such pastures, even when properly laid down, require "keeping up" by good treatment and suitable manuring.

Ploughing-up of Pasture and Re-laying.—There are some cases where, as at Laxton (Experiment 7) and Bodenham (Experiments 19 and 20), the soil is of a heavy impenetrable character and much affected by drought, and the pasture has been formed by allowing the land to "tumble down" to grass.

In these cases improvement by manurial means is of no practical avail. What is needed is to get the soil broken up, and to allow air to penetrate into it. There is nothing to do in such cases but to break up the turf, stir and cultivate the soil thoroughly, and then lay down again with a suitable mixture in which strong and deep-rooting grasses and plants prevail. In this connection reference may be made to the system advocated by Mr. R. H. Elliot, of Clifton Park, Kelso, who includes in his grass mixtures such plants as chicory, kidney vetch, and burnet.¹ The soil at Wilburton (Experiment 21) was of similar character to those mentioned above, but the grass mixture originally sown was evidently of better kind, and, as was seen, it responded to the application of basic slag.

Use of "Aërating Plough."—In one case (Wilburton, Experiment 21) mechanical improvement of the soil by running a plough under the turf, but without breaking this up, was tried, but the result was not found satisfactory.

Harrowing and Re-seeding.—In several instances this method was tried. Where there was a quantity of rough grass the harrowing certainly did good by removal of some of this and leaving space on which fresh or wind-blown seeds might settle. This was the case both at Limber (Experiment 6) and "Wilkinson's Land" (Experiment 14), but it could not be called generally satisfactory, and did not allow of any expensive outlay. Re-seeding was, owing to the drought that prevailed in 1896 just when the experiments started, in every case a failure, and no one pasture was, on this account, really renewed. This, however, must be largely a matter of season, and it would hardly do to say that such renovation is impossible.

Manurial Applications.—*Pond Mud and Road Scrapings.*—These were tried in three cases, viz., Laxton (Experiment 7) and Latimer (Experiments 9 and 10), but in neither case was there any advantage found.

Salt.—Salt was tried at two sites, viz., Latimer (Experiment 9) and Bodenham (Experiment 20), but no benefit resulted from it; it did not seem to alter the quality of the pasture nor to render it more palatable to stock.

Bone Meal and Dissolved Bones.—The experiments do not bring out any marked advantages as the result of using these materials. Bone meal has proved very slow in action; at one site ("Wilkinson's Land," Experiment 14), after showing no influence for five years, it certainly did then begin to tell, but at other sites it was without material effect; nor were dissolved bones any better. In the Barnsley district of Yorkshire there has long been a belief in the efficacy of bone meal,

¹ See "The Value of Plant Roots as Tillers of the Soil," by Robert H. Elliot, *Journal R.A.S.E.*, Vol. 58, 1897, pp. 467-477.

but the experience of the three sites there has shown nothing to justify this.

Kainit.—As remarked, the soils experimented on happened not to be deficient in potash, and hence no definite conclusions can be drawn, though, on soils much lighter in character, potash might have been shown to be a necessary constituent. Where, as at Latimer (Experiments 9 and 10), kainit has been extensively used, there is no clear proof of its being essential. Even on "Wilkinson's Land" (Experiment 14), where the soil had only 0.13 per cent. of potash, the further supply did not seem needed.

Nitrate of Soda.—In the two instances where this was tried in conjunction with mineral manures (Morton Jeffries, Experiment 18; and Wilburton, Experiment 21) the result was not more than to give a temporary increase of grass the first season, but to leave no permanent benefit.

Farmyard Manure.—The general effect of the use of farmyard manure by itself has been to produce a heavy growth of herbage, with increase of grass at the expense of clovers (Laxton, Experiment 8; Latimer, Experiment 9; and Basingstoke, Experiment 11). In a dry year, farmyard manure has done well, no doubt through aiding the retention of moisture; but the result has not been a lasting one, except in the one case of "Wilkinson's Land" (Experiment 14), where the land was very poor, and had long suffered from impoverishment. When, however, farmyard manure followed the application of lime (Tatton Park, Experiment 4; and Limber, Experiment 6), then the benefit was a marked and permanent one, and few plots did so well as these.

Mineral Superphosphate.—Where soils have contained sufficient lime, and where these are not too heavy in character, it has been shown that superphosphate is quite as effectual as basic slag (Limber, Experiment 6; Morton Jeffries, Experiment 18). Also, after land has been well limed, superphosphate can economically replace basic slag. But, in the absence of sufficient lime, superphosphate is not to be relied upon.

Basic Slag.—If there is one material besides lime, the value of which the experiments have brought out, it is basic slag. This is due in considerable measure, no doubt, to the experiments having been for the greater part on heavy cold lands, some of them in need of draining; but, nevertheless, it is made clear that basic slag is a material which every grass-farmer having inferior pasture would do well to try. Speaking generally, it is on heavy land of poor character and with a tendency to being wet, that basic slag will produce the best results, and on lighter lands it is less likely to be of advantage. It has undoubtedly on the former class of land (Laxton,

Experiment 8; Basingstoke, Experiment 11; Bishop Auckland, Experiments 13 and 14; Wilburton, Experiment 21; and Hatfield Peverel, Experiment 22) proved itself most efficient, and its application has resulted in the bringing up of a quantity of white clover where this was not apparent before. In regard to the time for which its influence will last, it would seem that this may reasonably be put at five years, after which it will be well to apply it again. Opinions vary as to the quantity of basic slag which it is advisable to put on at any one time. Mr. Hornsby at Laxton (Experiments 7 and 8) is strongly in favour of 5 to 6 cwt. per acre at most, whereas the Wilburton experiment (No. 21) and others would indicate that a not less quantity than 8 cwt. per acre is desirable, while even 10 cwt. per acre might at times be employed. Eight cwt. per acre seems to us, on the whole, a suitable dressing for grass land.

Lime.—Even more striking than the benefits derived from basic slag are those from the use of lime where land is deficient in this constituent. Nothing indeed, not even basic slag, can make up for it, and it is clear that the bad condition of much of the land of the country has come from the abandonment of the “good old practice” of “liming” land. As shown in the cases of Tatton Park (Experiment 4), Limber (Experiment 6), and Barnsley (Experiments 15, 16, 17), liming has been effectual where basic slag has entirely failed, this being in each instance where land was actually deficient in lime, having, say, 0.25 per cent. of lime or less. But, as shown in other instances (Bishop Auckland, Experiment 12; Wilburton, Experiment 21), liming needs following up with manure, unless where the land is heavily stocked. The main influence on the herbage is to sweeten it and make it more palatable to stock. Then, too, as pointed out already, it has a most potent action in destroying the accumulation of matted creeping stems of twitch which so often are found on inferior old pasture, and the existence of which tends to sourness in the soil and the prevention of germination of the seeds that fall upon the land. The lime works into this mass and destroys it, ultimately removing it from the surface of the good healthy soil. A consequence of this is seen in the fact that the land receives more moisture, which enables the roots of the grasses to penetrate down into the soil, whereas the matted creeping stems absorb the moisture and employ it for their own growth, leaving a dry and parched soil below. As regards the duration of lime, it is clear from these experiments that where 4 tons of lime to the acre have been put on, the influence has lasted all through the nine years of the experiments, and does not seem as yet exhausted, so that one can reasonably count upon a

period of at least ten to twelve years before a further application is required.

Gas lime was used in one instance (Laxton, Experiment 8), and had the effect of destroying a great deal of the rough grass and producing a sweeter herbage.

Botanical Considerations.—With the exception of basic slag and, to some extent, lime, which have undoubtedly brought up a quantity of clover, mainly white clover, the result of manuring has been seen, not so much in any change of the actual constituents of the pasture, as in a sweetening of these, whereby they have been better grazed subsequently.

Geological Considerations.—The attempt has been made to associate the profitable use of certain manures with the existence of the lands on certain definite geological formations, but, from various causes, nothing very definite can be drawn from this. On soils formed from, and resting on, the new red sandstone and lower greensand, it may be taken, generally, that lime will be most needed, while on heavy soils, like those on the lias, gault, and London Clay, basic slag will probably be found most useful. Yet on other formations such as the old red sandstone, the coal measures, and even the chalk, so much will depend upon the overlying beds, and whether these be light or heavy, rich or poor in lime, in phosphoric acid, and so on, that it is impossible to state conclusively what is likely to do best, and whether lime or basic slag or else superphosphate should be applied, and whether potash will be needed or not.

SUGGESTIONS FOR THE FUTURE.

As regards most of the sites the questions set for decision may be considered as answered in the experience of the plots which have done best, and which have already been described. As to the others the following suggestions are made: (*a*) In the experiments on laying land down to grass at Hatfield Peverel (Experiment 3) basic slag should now be tried. (*b*) On the light land of Tatton Park (Experiment 4) it might be well now to see whether smaller applications of lime—say of 1 ton and 2 tons per acre—would not effect the purpose and at less cost. This might also be tried at Limber (Experiment 6) and Barnsley (Experiments 15, 16, 17). (*c*) On the lias clay of "Willow Field" (Experiment 7) it would be best to plough up the land and lay down again with suitable mixtures: and in Laxton Park (Experiment 8), to decide by experiment whether 5 to 6 cwt. of basic slag per acre are equally effectual as the 8 cwt. hitherto tried. (*d*) At Bishop Auckland (Experiments 12 and 13), the applications of lime and basic slag should be renewed, and farmyard manure might be subsequently applied. (*e*) At Bodenham (Experiments 19 and 20), it would be best

to plough up the turf and lay down again with good seed mixtures. (*f*) At Wilburton (Experiment 21), basic slag should be renewed, and on the lime plot farmyard manure should be put. (*g*) At Hatfield Peverel (Experiment 22), the application of basic slag should be repeated. Lastly, as regards the other stations not individually mentioned, the most successful applications (basic slag especially) should be again given, with the exception of lime, as, where this has been applied with success already, it is desirable to carry on longer and to see for what period the benefit will last.

LOCAL INTEREST.

In a few instances, notably Latimer (Experiments 9 and 10), Bishop Auckland (Experiments 12, 13, and 14), and Basingstoke (Experiment 11), considerable local interest has been shown, and the results have been adopted generally in the neighbourhood. But beyond these it can hardly be said that wide-felt interest has been aroused. This is to be regretted, inasmuch as in several instances the results were of so marked a character as to form a useful lesson to those occupying land of like nature. In the minds of those who carried out the experiments, however, there has been no hesitation to accept and profit by the lessons learned.

ACKNOWLEDGMENTS.

It remains, in the last place, to acknowledge heartily the kindness of owners and occupiers in placing land at the Society's disposal for these experiments, and to thank those who undertook the carrying out of the details, for their readiness to do whatever was asked of them, as well as for supplying notes and information, and otherwise assisting the Society's scientific officers on the occasion of their several inspections.

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Notes and Communications.

EXPERIMENTS WITH WHEAT AND BARLEY HYBRIDS ILLUSTRATING MENDEL'S LAWS OF HEREDITY.

MENDEL'S original communication on Experiments in Hybridisation was presented to the Brünn Society in the year 1865. At this period the study of problems in heredity was receiving far more attention than it has had since. Nevertheless, although a detailed account of his experiments was published shortly afterwards in the *Verh. naturf. Ver. in Brünn Abhandlungen*, IV., 1865, judging from the almost absolute lack of reference to it by later writers, it was completely lost sight of. It was not until 1901, that attention was again called to this work by the practically simultaneous re-discovery, by De Vries, Correns, and Tschermak, of the laws Mendel enunciated. Hitherto much of our knowledge of the laws of heredity had been derived from the experiments of breeders working to a large extent from an agriculturist's point of view. This work led to no generalisations of lasting importance, but to many fanciful theories. The student need only consult the mass of data accumulated in Darwin's *Animals and Plants under Domestication*, or Focke's *Pflanzenmischlinge*, to realise how chaotic the whole subject was.

Mendel, by means of a single series of experiments, found the clue which has elucidated many of these mysteries and opened up lines of research that bid fair to give us more command over nature than breeders some five years back dared to dream of.

In his original paper he tells us that he was struck by the regularity with which the same forms appeared in crosses between the same species, and realising the importance of the phenomenon, he started to investigate it. At the outset he saw, that in spite of the mass of researches which had accumulated at that time, there was no series of experiments available from which the actual number of different forms occurring among the progeny of a cross-bred, or their numerical relationships, could be ascertained. No one had grasped the necessity of following out in detail the descendants of each individual cross-bred, or their descendants in turn. On the contrary they

had attempted to generalise from the miscellaneous mass of forms arising from cross-breeds. It was solely because Mendel examined the individual and its progeny separately and statistically that these far-reaching discoveries were made.

He chose the genus *Pisum*, using for the most part varieties of *Pisum sativum* (the edible peas) and some other closely related species, after some two years of preliminary trials, because (1) the varieties differ from one another in characters which are practically constant; (2) because there is only a remote chance, owing to the structure of their flowers, of their being accidentally cross-pollinated; and (3) because successive generations of the cross-breeds suffer no marked diminution in fertility. Thus nothing which could be foreseen was left to chance, and the whole scope of the problem was clearly defined beforehand.

Starting first of all with simple cases where the varieties crossed together differed from one another in a single character only, such for instance as two peas similar to one another except in the form of the seeds which was wrinkled or round, or in the colour of the pods which was yellow or green, Mendel found that the cross-breeds¹ resembled one of the parents so closely that one of the characters in which the varieties differed from one another either totally escaped observation or could not be detected with certainty. Thus the cross-bred seeds were round with no signs of wrinkling, the pods of the cross-bred plants green with no blending of yellow. Precisely the same results were obtained with reciprocal crosses, both round \times wrinkled and wrinkled \times round giving round seeds. Mendel called the character appearing in the cross-bred *dominant*, the one which appeared to be swamped the *recessive* character.

The following generation obtained by allowing the cross-breeds to fertilise themselves consisted of plants showing either the dominant or the recessive pod character, again with no transitional forms, and a statistical examination brought out the fact that they occurred in a ratio of 3 : 1 on the average. Among 580 plants, 428 had green pods and 152 yellow pods.

The seeds of the cross-bred gave a similar result, 5,474 being of the round type, 1,850 of the wrinkled—both forms generally occurring in the same pod. The first generation from the cross-breeds consisted of 75 per cent. with dominant, and 25 per cent. with recessive characters.

The seeds of the self-fertilised individuals were again sown separately, with the following results:—(1) The recessive types produced recessives only, they were "fixed"; (2) some of the

¹ i.e., The seeds produced as the results of cross-pollination, or the pods produced by the cross-bred plant.

dominant types were also "fixed"; (3) some produced dominants and recessives *in the proportion of three to one*. In other words the seeds or the plants showing dominant characters in the preceding generation, though externally similar, had not a similar constitution, and by breeding from them this difference was made manifest. On counting out the plots Mendel found that the 75 per cent. with dominant characters of the preceding generation consisted of 25 per cent. which were "fixed," 50 per cent. which "broke," or produced recessives as well as dominants.

This generation therefore in reality consisted of—

25 pure recessives ;
50 cross-breds ;
25 pure dominants ;

the cross-breds resembling the pure dominants as before, making it appear to be 75 per cent. of dominants to 25 per cent. of recessives. We may express it as $D-2DR-R$.

Mendel then went on to consider the case of a cross between two varieties, AB and ab differing in two pairs of characters, A and a , B and b , of which A and B were dominant over a and b .

The cross-breds were again all similar, and showed only the dominant characters, A and B . They thus resembled one of the parents. Their progeny after self-fertilisation could be grouped into four classes, as follows :—

AB . Showing both dominant characters.

Ab . Showing one dominant and one recessive character.

aB . Showing one dominant and one recessive character.

ab . Showing both recessive characters.

These forms appear in the ratio of $9AB : 3Ab : 3aB : 1ab$.

On raising the next generation from the individuals composing these groups they gave rise to the following forms :—

AB individuals. { All AB ,
or AB and Ab ,
or AB and aB ,
or AB , Ab , aB , and ab .

Ab individuals. { All Ab ,
or ab and Ab .

aB individuals. { All aB ,
or ab and aB .

ab individuals. { All ab .

Where two forms appear they occur in the ratio of three dominant to one recessive ; where four in the ratio of $9 : 3 : 3 : 1$ as before.

These numerical relationships would result if it be assumed that the gametes (the egg-cells and pollen grains) carry only one of the pair of differentiating characters, provided that they are produced in approximately equal numbers. Thus on crossing A and a we obtain a cross-bred whose gametes are not Aa but either A or a . On self-fertilisation a pollen grain carrying the differentiating character A may unite with an egg-cell carrying the same character, or the character a . It may therefore give rise to AA or Aa . Similarly a pollen grain carrying the character a may give rise to Aa or aa . If the two types of gametes occur in approximately equal numbers the possible progeny will be $AA + Aa + Aa + aa$, or $A + 2Aa + a$. But as A is dominant over a , it appears to be $3A + a$. Where there are two pairs of differentiating characters, A and a , B and b , the possible combinations are $AB, Ab, aB, ab, 2Aab, 2AaB, 2ABb, 2aBb, 4AaBb$, or as A and B are dominant over a and b , these appear to consist of four groups only, AB, Ab, aB, ab , in the ratio of $9 : 3 : 3 : 1$. The subsequent generation shows their true character.

So much evidence of the same kind has accumulated during the last year or so, both from experiments with animals and plants, that now it can no longer be doubted that this explanation is the correct one, and we are justified in our belief that the gametes are pure with respect to the characters they carry. At the same time these experiments have brought to light certain complications which need not be discussed here. It is sufficient to say that they in no way invalidate the above proposition.

The question which concerns us, as agriculturists, is the value of these particular discoveries. Will they prove of any value in improving our stock or crops? There need be no hesitation in saying that they will prove of the utmost value, and that agricultural science has few more hopeful problems before it than the following up of the lines of research laid down by Mendel.

To test the possibilities of the application of Mendel's discoveries a number of experiments have been carried out on the Experimental Farm of the Agricultural Department of the Cambridge University. The experiments on breeding wheats and barleys have now reached a stage at which it is possible to see some definite results, and to foresee the certainty of valuable discoveries in the near future.

Both of these cereals are peculiarly well adapted for a study of Mendel's laws. There are numerous races of wheat which differ from one another in constant characters, *e.g.*, bearded and beardless, rough and smooth, red and white, lax and dense ears, &c. Similarly among the barleys we have

six and two row, bearded and beardless, bearded and hooded, lax and dense, black and white races, &c. Both cereals are self-fertilised and the cross-breds are fertile.

Taking, first of all, some examples from wheat, the results of crossing races showing certain characters are shown in the Table :—

<i>Parental Characters.</i>	<i>Character of Cross-breds.</i>
Lax × dense	Lax.
Beardless × bearded	Beardless.
Rough × smooth chaff	Rough chaff.
Red × white grain or chaff	Red grain or chaff.
Keeled × rounded glumes	Keeled glumes.

The characters appearing in the cross-bred are the dominant ones, the corresponding recessives being dense, bearded, smooth chaff, white grain or chaff, and round glumes.¹ With one exception the dominant characters mentioned above appeared in full intensity in the cross-breds. The length of the beard, the bright red of the chaff, &c., underwent no diminution. The exception is the case where Rivet wheat was used as a rough-chaffed parent. Then the cross-breds were not as velvety as the Rivet wheat. If Rough Chaff or Old Hoary was used then this character appeared in full intensity. The cross-breds differed in one respect though from the dominant-character-bearing parental form. They were peculiarly vigorous; first crosses with Rivet wheat being often fully seven feet high, whilst their tillering power was enormous. After self-fertilisation the progeny of the cross-breds consisted approximately of three dominant to one recessive form, *e.g.*, bearded : beardless : : 118 : 43, in another cross as 273 : 91; rough chaff : smooth : : 104 : 35, in another experiment as 373 : 140; red chaff : white : : 329 : 115, &c. The following generation showed that the recessive forms bred true to type in all cases, but that the dominant type was composed of individuals which either bred true to type or again “broke” into dominant and recessive types in the ratio of 3 : 1, and this in spite of the fact that one could distinguish no difference between them. This generation then consisted of pure recessive, pure dominant, and cross-bred forms; and a statistical examination of many cases showed these to be present in the average proportion of 1 : 1 : 2.

The breeder must note, then, that external appearances are no guide to the purity of any individual that depends solely on its gametic condition; the one test is to breed from it. For instance, an animal may appear to be a pure Aberdeen Angus, in reality it may be a cross-bred Shorthorn Angus, and crossing with the recessive type (the Shorthorn) alone will settle the point.

¹ Many other pairs of characters have been investigated, but a consideration of these must suffice for the present.

The following generation showed that these extracted recessives and dominants again bred true whilst the cross-bred forms broke up as before. In more complex cases, such as crosses between races differing in more than one pair of characters, Mendel's Laws were again found to hold with the same accuracy. As an example we may quote the case of a cross between Rough Chaff and Golden Drop, *i.e.*, a white, rough-chaffed wheat \times a red smooth-chaffed wheat. Here the rough chaff (A) and the red colour (B) are dominant, the smooth chaff (a) and the white colour (b) recessive.

The cross-bred was rough-chaffed and red. Its progeny, after self-fertilisation, consisted of four types of individuals:—rough-chaffed red (AB), rough-chaffed white (Ab), smooth-chaffed red (aB), and smooth-chaffed white (ab), in the proportion of 9 : 3 : 3 : 1. In this generation, therefore, we have two new types appearing AB and ab —as well as the parental forms Ab and aB .

After self-fertilisation the individuals of this generation behaved as follows:—

Rough-chaffed red. AB .	{	All rough-chaffed red, AB . Rough-chaffed red and white, AB and Ab . Rough-chaffed red and smooth-chaffed red, AB and aB . Rough-chaffed red, rough-chaffed white, smooth-chaffed red, smooth-chaffed white, AB , Ab , aB , and ab .
Rough-chaffed white.	{	All rough-chaffed white, Ab . Rough- and smooth-chaffed white, Ab and ab .
Smooth-chaffed red.	{	All smooth-chaffed red, aB . Smooth-chaffed red and white, aB and ab .
Smooth-chaffed white.		All smooth-chaffed white, ab .

From this it is evident that the rough-chaffed red individuals were gametically either AB , ABb , AaB , or $AaBb$; the rough-chaffed white either Ab or Aab ; the smooth-chaffed red either aB or ab ; the smooth-chaffed white all ab .

The next generation from the plots which had produced the one type only, that is where the individuals composing them were all rough-chaffed and red (AB), or all smooth-chaffed and white (ab), &c., showed that these types were fixed, for they bred true without exception.

As the result of this cross we have therefore four fixed types, two of which—the rough-chaffed red and the smooth-chaffed white—are new, and two—the rough-chaffed white and the smooth-chaffed red—which cannot be distinguished from the parental forms. By in-breeding from cross-breds we have therefore reproduced the parent types. In the same way from other crosses where Rivet wheat was one parent a pure Rivet

wheat absolutely indistinguishable from the parent has been picked out of the progeny of the cross-bred and grown on for two seasons without showing any signs of "reversion." Such a fact is so markedly at variance with what one hears of the experience of breeders of pedigree stock that it may be worth stating in another form. Thus, among the progeny of two cross-bred Shorthorn \times Aberdeen Angus, pure Shorthorn and pure Aberdeen Angus individuals would occur,¹ and further, they would stand the test of being bred from, for if crossed with the pure type of Shorthorn or Aberdeen Angus respectively *only* the pure types would result. To the breeder of pedigree stock the question at once arises, "Should such animals find a place in the herd-books?" The value of pedigree as we see it now lies in the fact that the gametes (ova and spermatozoa in this case) of the individuals of any particular strain are all of the same type. That now is the sole test of the purity of a strain, and as far as gametic purity goes such animals are indistinguishable from those of the most carefully bred herds in the world. Yet their grandparents were Shorthorn and Aberdeen Angus.

Turning now to barleys, we find again that the laws enunciated by Mendel hold with the same accuracy. It would serve no useful purpose here to describe the investigations so far made in any detail. I must content myself with grouping some of the more important characters into dominants and corresponding recessives, as a knowledge of this will enable any one to foretell with reasonable certainty the results of any particular cross between races showing these characters.

<i>Dominant.</i>	<i>Recessive.</i>
Two row	Six row.
Abyssinian types	Two row.
Lax	Dense.
Awnless	Awned.
Hooded (<i>i.e.</i> with trifurcate palæe)	Awned.
Dark coloured (black or purple, &c.)	Light coloured.
Adherent palæe	Naked grain.

So far, though, we have only dealt with characters which are either dominant or recessive—characters similar to those found by Mendel in his original work with peas. There are, however, a considerable number of pairs of characters which on crossing do not show any clear dominance or recessiveness; and it is important to realise that this particular phenomenon—probably a very common one—in no way interferes with the fundamental fact that the gametes are pure with respect to the characters they carry. Such a character as the grey colour of the chaff of Rivet wheat may be well marked in a cross-bred with a white

¹ I say nothing of the other types appearing in this generation. The story promises to be a complex one.

chaffed parent or it may be hardly discernible. Similarly, one cross between a hooded and bearded barley may give a cross-bred which is hooded, whilst by using another bearded barley a cross-bred with hoods borne on awns may result. One example of interest from several points of view is afforded by a cross between Rivet wheat and Polish (macaroni) wheat. The latter has very long glumes (chaff). The glumes of the cross-bred are intermediate in size between the two parents, so that neither the large type of glume or the small can possibly be called dominant or recessive. Nevertheless the progeny consists of the following types: large, intermediate, and small glumes in the proportion of 1 : 2 : 1. Evidently, therefore, the cross-bred produces large and small gametes in approximately equal proportions. If the gametes carrying the large glume character meet we obtain the large glumed type, if the small the small, if large and small meet, as in the original operation of crossing, the intermediate type results.

All the evidence which has accumulated then goes to show that the characters of the plant or animal are distributed among the sex-cells according to a definite system, and the possible combinations of these characters can be foretold with considerable accuracy. To the breeder the value of this knowledge can hardly be estimated. Once he knows the behaviour of particular characters of the varieties he is working with, he can definitely choose the parents which will give him the combination he desires, and obtain it, fixed, in the first or at the latest in the second generation from the cross-bred. This is worth comparing with one's expectations in the dark pre-Mendelian days. Then one might by chance find the required type among the mixture resulting from the cross-breds; more often it was a case of the selection we hear so much of—the picking out of such a form as the rough-chaffed red wheat which in the following generation might breed true, or with far greater probability (the chances can be easily calculated) would break up into a number of forms similar to those from which it was originally chosen. A further selection from the mass would in all probability give the same result. Small wonder is it then that competent breeders have given up as hopeless problems the solution of which we now know to be simple.

One concrete case will show the value of Mendel's discoveries in this direction. In 1875 Rimpau crossed together a lax red-chaffed wheat with a dense white-chaffed wheat. The four types of red and white lax or dense ears were not fixed until 1886. Now three seasons would be ample. So far though we know little of the possibilities of introducing absolutely fresh characters into our crops and stock; we are simply in a position

to arrange already existent ones in new combinations. Yet judging from analogy with some of our garden plants, where something is known of the history of the origin of certain forms, the results of continuous crossing seems to be responsible—in some way or other—for the production of fresh characters. Somewhat similar examples are being met with among the cereals. Of one thing we may be certain, that is that definite laws underlie these phenomena, and research in the right direction will make clear what now appears as mysterious, as did the results of the breeders who had to work in ignorance of Mendel's discoveries.

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Cambridge.

TURKEY FARMING.

FORMERLY the varieties of turkeys met with in Western Europe were three, namely, the Black, the Cambridge Bronze, and the White, but others have been added to the list. We now know the American Bronze, the Italian, the Slate or Blue, the Fawn, and what is called in America the Narragansett. I propose to describe their leading characteristics.

BREEDS.

Black.—East Anglia has been famous for its turkeys for generations, and the name Black Norfolk was given to a variety which at one time held the premier position in respect to quality. Even yet turkeys produced in Norfolk and the adjacent counties of Suffolk and Cambridge command the highest prices and stand in the front rank for quality, though few of the older type of bird remain. Since the demand for larger specimens they have been displaced by the American Bronze. Contributory to this result was the fact that they had lost vigour and had become increasingly difficult to rear, doubtless due in large measure to in-breeding and the use of immature stock birds. Black Turkeys are largely bred in France.

Cambridge Bronze.—The Cambridge Bronze (Fig. 1), which is now bred to a considerable extent is evidently due to a cross, probably first of the Black Turkey, and finally of the American Bronze. The latter influence has done much to add to the brilliancy of its plumage, but in this respect, and also in size, it cannot be compared with the American; hence it is not seen in our live stock exhibitions. The average weights are about 24 lb. for cocks and 16 lb. for hens. Although seldom shown at ordinary exhibitions, turkeys of this class

have generally taken a leading position in the dead poultry shows, where their superiority in meatiness and quality is recognised. For thickness of breast meat, for softness of flesh, and for lightness of bone, they have no equal; and whilst under ordinary conditions they are medium in size, when fattened they carry an abundance of flesh and are much less prominent in breast blade than other breeds of turkeys. The weights they attain are quite equal to market demand. The largest dead turkey I have seen was of the Cambridge variety, and scaled at 33 lb. The premier position for quality

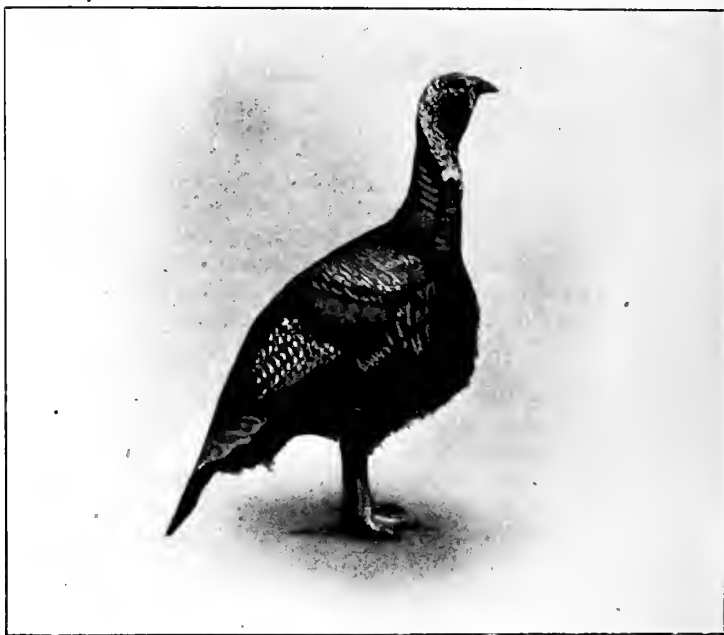


FIG. 1.—Cambridge Bronze Turkey.

and size combined can fairly be given to this variety, and we believe it is the turkey which will yield the best return to the farmer who does not keep in view the exhibition of live birds. In shape it is wide in shoulders, deep in body, long breasted, and short on the leg. Leggy, heavy-boned specimens may look bigger, and often are larger in frame, but when fed up do not yield the same proportion of flesh.

American Bronze.—Specimens of this variety have been known in Britain for nearly a hundred years. (Fig. 2). Records are available of importations by Lord Powis, Lord Leicester, and others in the early part of last century, but they were not

widely distributed until about forty years ago, when the great demand for turkeys at the Christmas season began and has since continued to increase. With the growth of this demand came the inquiry for large birds, which no other breed could so easily meet. But the belief, which had abundant justification, that the American Bronze was the hardiest of all the turkey family, ensured its general adoption, and in this respect, whether bred pure or crossed with existing races, its introduction has rendered great service.

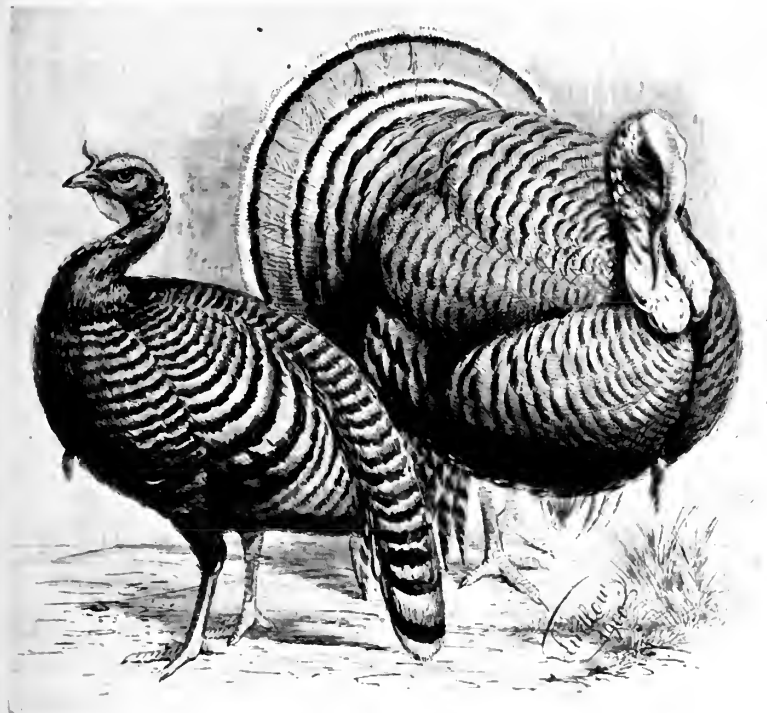


FIG. 2.—American Bronze Turkeys.

White.—In England the White Turkey is simply so called: in America it is designated the White Holland, although it is widely distributed in South Europe, more especially in France, Austria, and Hungary. The finest display I have seen of these birds was in Hungary, where white plumaged poultry of all kinds are preferred, as the feathers are more valuable than if coloured. As a rule these birds are small, but in Hungary it was not so. Their burnished feathers, and the brilliant red head and neck, and pale shanks, make a *tout ensemble* which is

very pleasing. In this country they are regarded as delicate, but probably this is due to in-breeding and preparation for exhibition rather than to natural weakness. As a market turkey they are scarcely kept at all. In Southern Europe, however, they are regarded as equally hardy with other breeds.

Narragansett.—In the New England States of America, more especially Rhode Island, a variety is popular which is called the Narragansett, after a tribe of Indians who occupied that part of America. It is not quite so large as the Bronze, and is shorter in the leg. The plumage is black, but each feather has a broad band of light steel-grey, edged with black. They are said to be excellent layers and to mature quickly, for which reason they meet a demand for small birds in the pre-Thanksgiving days of the autumn, and even for later killing at five or six months old.

Italian.—Large numbers of turkeys are sent from Italy to the United Kingdom in the autumn and winter, but these are small in size and dry in flesh. The type of turkey seen in Italy is dark grey in colour, not much above the size of well-grown fowls, and the largest specimens I have seen in that country did not exceed 12 lb.

In addition to the varieties named above there are Buff or Fawn, Slate-colour or Lavender. The former is frequently seen at Continental exhibitions, and are large, well-developed birds. At one time Copper-coloured turkeys were often met with in East Anglia, but neither they nor the Slate are at present kept to any extent for marketing purposes.

THE QUESTION OF SOIL.

Turkeys are essentially farmers' fowls, as they require plenty of space, both during the growing stage and as breeding stock. Experience has abundantly proved that if bred under restricted conditions they are delicate and stunted in size. Hence this class of poultry is more suited to occupiers of large farms than upon small holdings; for not only is it essential to success that full liberty be given, but there should be room enough to permit of annually changing the ground upon which they are kept and reared. To this point too much importance cannot be given. Even upon large farms it is necessary from time to time to give the land a rest, in order to bring the soil into absolutely fresh condition. The principles which are applied to cultivation, as expressed in the four-course system, should be equally adopted in respect to fowls, more especially when kept thickly upon the ground, as is usual with poultry of all kinds.

It is not every part of the country that is favourable to turkey growing. Climatically there is no serious hindrance

in any part of the United Kingdom. Variations there may be, but the range between Sutherland and Devon, between Derry and Cork, is not so great as is often imagined. Nor is it one of rainfall. Ireland, which may fairly be regarded as the wettest section of the British Isles, raises large quantities of turkeys of excellent quality. It is entirely a question of soil and location. Damp and heavy ground are equally undesirable. The former is fatal to breeding stock and young birds alike, causing diseases to which the race is specially subject. The latter in an unfavourable season checks growth, the chicks thrive badly and do not make as fine table fowls as when raised upon a more kindly soil. This explains why East Anglia has held the pre-eminent position in Britain, and Normandy in France, for turkey production. Light, well-drained, fertile soil is a *sine quâ non* for these birds, and whilst good pastures are excellent for rearing, the great advantage of arable land, when of a suitable nature, is that it affords food and protection as afterwards detailed. The position selected should be undulating, as this usually offers a greater amount of shelter.

A writer in one of the American journals, who has been a most successful raiser of turkeys, recommends a "hilly, rocky slope," facing south, and this opinion is supported by our experience. Some of the most successful breeders of turkeys have lived in the hilly districts of the north and west of England. Under such conditions the ground is usually drier than on the flats, which explains the success attained, even though the land is chiefly for grazing.

THE BREEDING STOCK.

One reason why many farmers do not breed turkeys is on account of their supposed delicacy, or weakness of constitution, making them difficult to rear. That there is a justification for this opinion is undoubted. No class of poultry requires more careful and constant attention during chickenhood. This is not a question of climate, for the same opinion is held in America—the native land of the turkey—as in Europe.

In theory nearly all breeders agree that a turkey hen should not be used for stock purposes before her second year, but in practice this is seldom adhered to. Mr. Gage Harper, who is a successful turkey breeder in East Anglia, recommends the use of second-year hens with early-hatched, well-developed young cocks, and he keeps the hens as long as they are strong and active, usually to the third or fourth season. The objection raised against older turkey cocks is that they are too heavy for the hens, which would be true if yearling females were mated with them, but it should not be so otherwise. Were mature stock employed the progeny would be much hardier.

Bearing in view what has already been stated as to the class of turkey which yields the best table bird, the farmer should select as breeders well-developed specimens of the Cambridge Bronze variety, long and deep in body, wide across the shoulders, with large powerful wings, and standing well on short legs. The cock may be deeper in body than the hens. They should be muscular on the breast, and be tight in the plumage. The lighter in bone the better, so long as it is stout enough to carry the carcass. As all breeding birds should be in hard condition, that is, not fat, the weights for cocks may be from 18 lb. to 22 lb., and for hens from 12 lb. to 17 lb., in accordance with age. One male bird to eight hens is a very good proportion. To bring the birds into good condition they should be fed from January onwards upon good, stout oats, which will have the effect of getting rid of surplus fat, and ensure greater vigour in the germs of eggs and the chickens when hatched. Even of oats it is possible to give too much, and the object is to supply any deficiency in natural food, for which the birds should be encouraged to forage. The oats are better if scattered among litter, and not merely thrown on the ground.

HOUSES AND ROOSTS.

Much has been written in favour of what is called the natural method of keeping turkeys, namely, allowing them to breed in the woods as they would in a wild state. There can be no question that such a system, where possible, ensures a greater amount of vigour in the stock and in the young birds than if kept upon an ordinary farm, whilst there is a flavour in the flesh thus produced which is exceptional. For the purpose of securing fresh, virile blood this plan is deserving of all support. But turkeys bred under these conditions, so far as my observation goes, do not attain the size required upon the markets, and they would not take at all kindly to fattening. Further, it is questionable whether turkeys can be produced profitably in this country under such conditions.

The drawing of the perch shown (Fig. 3) is that used by Mr. Gage Harper for his young turkeys after they are three months old. These perches are made of tree poles about one and a half inches in diameter, and are three feet above the ground. They are placed below trees and under the lea of high hedges. The chief risk of this system is from foxes, which have a fair field for their depredations under such conditions. Reynard may be circumvented to some extent if the ground around the trees and the roosts is thickly strewn with gas lime and asafœtida, over which he will not pass. But should these not be renewed as often as required, so that the pungent smell is evident at some distance, then the turkey breeder will

certainly realise the folly of neglect. Gas lime should also be lightly scattered under the trees and roosts.

Under ordinary farm conditions, and more especially where by reason of the absence of trees or the need for protection the open air method is impossible, the turkeys must be provided with a house or shed. Under no circumstances should they be herded with other fowls, as that would be equally bad for both species. Such houses must be freely ventilated. Turkeys need fresh air in abundance, and without it they cannot be expected to thrive. A poultry house of the ordinary pattern is useless for this purpose, no matter how large it may be. If a piece of shedding, facing south, open in front but closed at the back and two ends, is available, that will answer the purpose, but it is essential that there should be openings in the gables above the heads of the birds. It should not be less than 9 ft. high at the eaves to allow plenty of head room. Or a shed may be built on the plan given in the accompanying illustration

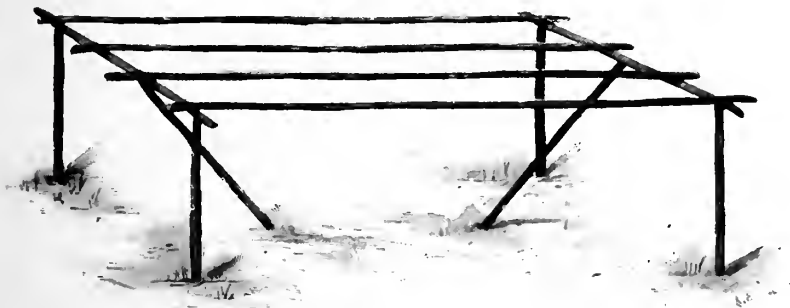


FIG. 3.—Perch for young Turkeys.

(Fig. 4), which represents a house 40 ft. long, 15 ft. wide, and 10 ft. high. Should it be necessary for protective purposes to enclose the front, laths three inches wide and with equal space between will be much better than wire netting, as the latter is not strong enough to resist the pressure of the birds when fully grown. Allowing fifteen square feet of floor space for each bird, a house of the size named would accommodate forty turkeys, which is a large enough number to keep under one roof.

Perches or roosts should be made similar to that already illustrated (Fig. 3), but with only two rods, so that there may be a free circulation of air for all the birds. It is better that the perches be made in short lengths, and thus be easily removed. The floor should be raised to ensure dryness, and be covered with peat moss litter below the perches. If the front half of the floor is littered with cut chaff, the birds can be fed there each evening, thus facilitating the work of getting them into the house, which often involves considerable labour

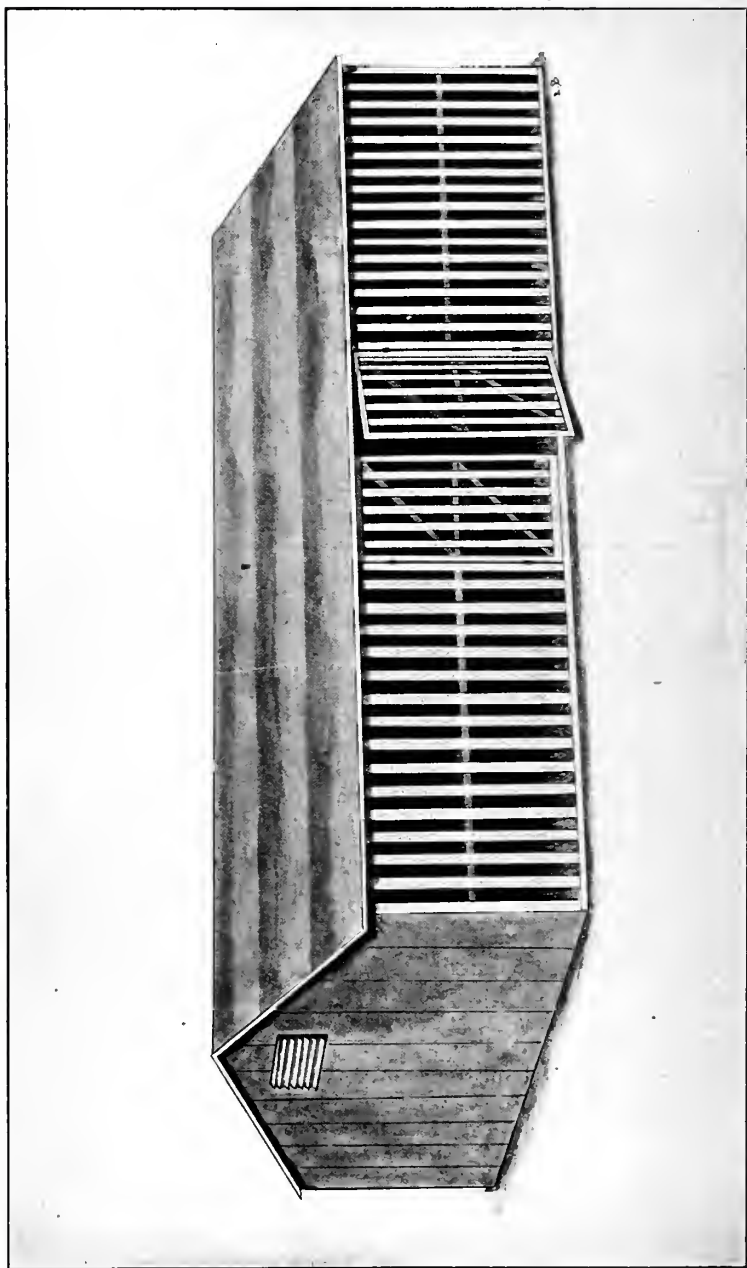


FIG. 4.—Turkey House.

and trouble, especially when the turkeys have been accustomed to roost in the trees. Turning over the peat moss litter, and occasionally scattering upon it a little finely slaked lime, will keep the air sweet. Under these conditions turkeys can be maintained in a healthy state, provided that other arrangements are equally satisfactory. Such shedding would only be required for the breeding stock, the young birds intended for killing at Christmas not needing, unless the season is exceptionally unfavourable, to have special arrangements made for them. An empty barn with a well-sheltered paddock is sufficient for the fattening stage.

HATCHING AND REARING.

Great though the progress in artificial incubation has been during the last few years, and widespread as is the use of incubators for the hatching of chickens and ducklings, these machines are not employed for hatching turkeys' eggs. That they can be successfully used is unquestionable; but the turkey hen is so faithful and reliable a sitter and mother, that there is no advantage offered by the artificial method over the natural. The use of brooders is not to be recommended for turkey chicks. The feeling that these young birds are by nature tender, needing special care, has made breeders afraid of taking unnecessary risks, and as there is no benefit in early hatching there are usually plenty of sitters available. Under these circumstances the most satisfactory method is to use the turkey hen for hatching, but if she lays more eggs than she can cover, the surplus may be given to an ordinary hen.

Turkey hens first commence to lay towards the latter end of March, and a second time in August, two nests in the year being very general. As the time approaches it is desirable, with a view to avoiding the trouble of searching for nests, to place sugar barrels or roomy boxes in out-of-the-way corners well secluded, and in these to make nests with a china egg in each. Usually the hens imagine they have found a secret spot and lay there. The eggs are removed every day and carefully stored in a cool place. When the hen commences to sit she may be allowed to do so in the same position. A preferable plan, where there are likely to be several hens sitting at the same time, is to fix large nesting-boxes (at least twenty-seven inches square) in a well-ventilated shed, as the hens will thus be under more complete control, and the labour of attending to them will be greatly minimised. Should the former plan be adopted, the male must be removed immediately the hen commences to sit, or he will disturb her and probably break the eggs. This danger is entirely avoided by the second method, which is that recommended. The nests should be

made on the ground or upon a thick bed of moist earth, well hollowed in conformity with the shape of the hen, and covered with straw or grass. If she is removed from the outside nest at night, there is seldom any difficulty in inducing her to take to the new nest.

The number of eggs laid by turkey hens varies considerably. At one time twelve or fifteen was the usual nest, but by removal of the eggs twenty to twenty-five can often be secured from each hen ere she commences to sit. It would be undesirable to give so many to one bird, large and roomy though she may be, and thirteen or fifteen are quite enough. The remainder—not exceeding nine—should be placed under a well-feathered ordinary hen. Both lots should be put down at the same time, for when hatching is completed all the chicks can be given to the turkey, which can brood a larger number than she should be allowed to hatch.

It is often the case, especially when under cover, that turkeys are very close sitters, and must be lifted off for feeding every day. They should be carefully handled, and by the same person, as a stranger will frighten them at this period. A feeding place is desirable, such as an open yard, and in addition to grain and fresh water a good dust bath should be provided, whilst an occasional dusting of the feathers with insect powder is desirable. The process of incubation takes about twenty-eight days. With such heavy birds, and especially as the turkey chicks are very stupid when first hatched, there is great danger of their being crushed. To avoid this Mrs. Gage Harper places the eggs in a large Hearson incubator on the twenty-sixth day, or as soon as chipping of the shells commences. They are hatched out in the machine and dried off, when they are returned to the hens, who make no objection to this arrangement, and it is claimed that a considerable amount of loss is thus prevented.

For the accommodation of turkeys and their broods large roomy coops of the ordinary pattern are employed. These should be placed about thirty yards apart on a good piece of short grass, where they will be sheltered from the north and east winds. For the first few days it is desirable to attach to the coop a wooden-framed run, about a foot deep and covered with wire netting, as the chicks at this stage are very slow in finding their way back should they stray. After ten days the turkey hen may be given her liberty, but where a hen is employed it is safer to keep her cooped for a longer period. Care must be taken to close in the hen and her brood at night. In all cases the coops should be moved on to fresh ground daily. Where there is plenty of natural shelter nothing more need be done, but in the wind-swept districts, and more

especially during the prevalence of east or north-east winds, that is not sufficient. An excellent plan which I first saw on a Suffolk farm is to plant a field in rye grass, and as soon as the rye is tall enough, to cut lanes with the mower in various directions, but always to avoid the prevailing winds. The coops are then placed therein, so that the young turkeys have all the benefit of fresh ground and are completely protected from the wind which blows above their heads. Very often we have the combination of an east wind and sunshine. On open ground the warmth of the sun's rays are more than counteracted by the biting air. But under the plan noted it is not so.

When the hen is at liberty she will strip the heads of the grass, and the chicks will devour the seeds with avidity. At about eight weeks the red begins to appear on the heads, and soon afterwards the hen feels that her part of the task is over. If the coops are moved gradually near to the perches or trees they quickly begin to roost there, often led by the hen herself. By this time the serious difficulties of the turkey raiser should be over, as the growing chicks are now found to be as hardy as any other class of poultry.

FEEDING.

The feeding of stock turkeys does not differ materially from that of the other classes of poultry, as they obtain an abundant supply of green stuff and natural food by foraging. The chief object should be to maintain them in hard condition, which can best be secured by giving them as much liberty as possible, and encouraging them to seek for whatever food they can obtain. With heavy birds a considerable amount of damage would result if they were allowed to wander over growing crops, but early in the year, even upon arable land, they may be permitted access to the cultivated fields. As a rule, however, they must necessarily be restricted to pastures. Such food as is provided for them is with a view of making good any deficiency in natural supplies, and any of the ordinary grains—wheat, oats, barley—can be fed, now and again giving a feed of beans or peas. Whole cereals or legumes yield more favourable results than meals, keeping the body muscles in firmer condition. But it should always be remembered that turkeys are great eaters of grass and other forms of green food, and that health can only be maintained by plentiful provision of vegetable products. This applies to adult and young birds alike. The advantage, however, of broken ground is that they find exercise in seeking for seeds, &c., which are more available than on grass lands. Steamed clover-hay is very serviceable in a season when grass is deficient in quantity or quality.

How to feed young turkeys in order to secure the best results is a problem which meets those who attempt this

branch of poultry-keeping. Many and varied are the methods recommended. There can be no question that upon the first treatment depends very largely the success achieved. Nutritious food is essential, for these birds are quick in development, and must assimilate a large amount of food. Consequently, we are almost compelled to stimulate the appetite, otherwise, although the chicks would be strong and hardy, they would not make the growth required. The chief danger to be avoided is the giving of rich food, as there is no race of domestic poultry so subject to digestive derangement, or which fall victims so easily to disease. There is a great variety in natural food, and under favourable conditions our object should be to supply that which will supplement, not counteract, such food.

After hatching is completed the young turkeys should remain in the nesting place for at least thirty hours before removal to their first home, in order that they may recover from the strain of hatching. This is especially important during cold or damp weather. Taking these tender creatures from a warm, cosy nest to a cold coop, before they are physically ready for the change, frequently results in chills and death, and will account for weakness in many birds. During this period they will not require any food, but the hen should be given a plentiful supply. The earliest food given to young turkeys is rice simmered in milk, and in this an egg or two may be stirred as the rice is cooking. When the rice is soft without losing its granular appearance, it should be mixed with sifted oatmeal, biscuit meal, or good middlings, so as to make the mixture dry and crumbly. These should form the staple diet for a few days, but as a variation milk curds mixed with meal, steeped oatmeal, or Spratt's meal may be used. Eggs are sometimes recommended either boiled hard, or made into custards, but many breeders have come to the conclusion that they should be used sparingly.

After a fortnight the food is gradually changed, introducing barley meal mixed with middlings and buckwheat, which latter is boiled at first and mixed with the rice. Later on the buckwheat, which should be thin-skinned, may be fed whole, but rice must never be given uncooked. When about six weeks old boiled wheat is excellent, and by this time it is unnecessary to give the finer foods recommended at first. As soon as they have "shot the red," and gone up to roost, they may be fed upon wheat, buckwheat, and barley, varied once a day with boiled wheat, dried off with barley meal. In the early stages the chicks should be fed five or six times a day, the first time as soon as it is daylight; but after they are a month old four times is sufficient, and this number may

be still further reduced when they are able to forage for themselves. Feeding is, however, always a matter of judgment, for so much depends upon the season and conditions. No hard and fast rule can be laid down. During the chickenhood stage meat in one form or another is essential to rapid development and strong frame. Mutton or mutton greaves are the best, but where rabbits are plentiful, they form an excellent and cheap substitute. They must be boiled and mixed with the soft food.

Lettuce, dandelion, onions, dock leaves, nettles, mustard and cress, are all valuable as green food. During the growing stage water or sweet milk should be given at feeding times, but must never be allowed to stale or sour. It cannot be too strongly emphasised that during the entire period of growth there must be always at hand a plentiful supply of grit.

Summer feeding will vary considerably. In a variable season, when grass and other green stuff is abundant and full of nutrition, the turkeys will obtain the greater part of their food from that source. A little grain in the morning, and a more substantial feed of mixed meal in the evening will be sufficient. But in a dry year, when everything is burnt up and the ground is hot and hard, then the birds should be placed as near cool woods as possible, and will require much more food. In poultry, as larger stock, methods must be adapted to circumstances.

Upon arable farms the turkeys should be placed upon the stubbles as soon as the corn is carted. They are splendid gleaners. At that time one feed a day, a mixture of meal and milk at night, should be sufficient. During the summer and autumn it is necessary to keep a boy with the flock, or they will scatter too widely and may do a great amount of damage. In September and October, with a view of bringing them into good condition for fattening, the birds may have plenty of turnips and swedes, either pulled and given near their roosts, or they may be put out within hurdles on the growing roots. It is important to remember that in the late summer careful selection should be made of the birds which are intended for use or sale as breeding stock, separating them from those which are intended to be marketed as Christmas turkeys, and feeding them on the plain diet as previously recommended. Not only would there be a great waste of food if they were fattened, but the process would be injurious. I need hardly say that the birds selected for stock purposes should be the best of the flock.¹

¹ One of the chief turkey breeders in East Anglia estimates the cost of raising young turkeys to be from 7s. to 8s. per head, not counting the run of the stubbles, and says that turkeys hatched about the first week in April, if reared well, should weigh by the first week in October: cocks about 20 lb., hens about 13 lb.; and by December 12: cocks 25 or 26 lb., and hens 16 or 17 lb.

MARKET DEMANDS.

The sale of turkeys in America reaches its high water mark previous to Thanksgiving Day, but in this country Christmas is the season of sale for the best qualities. The business done at that period is enormous, and the sale year by year increases, so much so that the supply of high-class specimens does not nearly meet the demand, more especially for home produce. To a limited extent the best French make up for this deficiency, but these are not so numerous as in former years. Messrs. Brooke Bros., of Smithfield Market, inform me that they have had as many as 13,000 turkeys from Normandy within a few days before Christmas, but not during recent years. Large consignments arrive from Italy, Hungary, Canada, &c., but they have not the size or quality suited to the best trade. During my visits to Hungary in 1902, Italy in 1903, and Servia in 1904 I did not see any turkeys equal to the best English and French.

It may be explained that at one time those who desired the finest specimens of turkeys procured supplies from East Anglia. Of late years, however, it has been very evident that fewer of these birds were passing through the ordinary trade channels than formerly, that is, appearing in the poulterers' shops. Now the trade has altered. Buyers from the great stores and traders go down in November and buy up the supplies, which when killed are sent direct to the customers, in many cases in single hampers. Hence it is that the East Anglian turkeys do not appear in the shops.

FATTENING.

An abundance of milk is the secret of success in fattening. Other foods may be varied to some extent so long as there is plenty of skim milk available. Good birds are produced without milk, but never the best specimens.

Whilst the process of fattening only occupies four weeks, preparation is made by changing the food three or four weeks previously. At this time turkeys are fed in the morning liberally with soft food consisting of barley and wheat meals. If intended for the Christmas market, they are put up to fatten about November 20 in a dry, roomy, comfortable, but well-ventilated shed, which should be closed in on the north and east sides, but which may be wire-netted or barred to the south and west. The shed should allow at least fifteen square feet of floor space for each bird, and is better if connected with a small paddock or open yard, to which the birds can have access during fine weather. Perches or roosts similar to those already described are used. The food and liquid for drinking may be placed in vessels either at the front of the shed or in the yard.

As a rule the birds are fed twice a day, but in some cases three times, and they must be given all that they will eat. The

morning feed consists of barley meal, wheat meal, and buckwheat meal, mixed with skim milk to a crumbly consistency, and to this about half an ounce of fat per bird per diem will be beneficial, though the quantity can be increased during the last week or ten days. Boiled potatoes are advantageously mixed with the meals. The afternoon feed should consist of barley, oats, and buckwheat, to which peas may be added occasionally, say, one-twelfth of the total weight. These grains are better steamed or steeped. As already mentioned, skim milk may be given the birds to drink. In addition, cabbage or roots are valuable, helping to keep the blood cool, and there must be a plentiful supply of coarse grit and sand, to which a little slaked lime or old mortar can be added.

The wonderful quality seen in some of the French turkeys—though I do not think that the flesh is as tender as in the best home-fed birds—is due to the use of milk and to the fact that the birds are hand-crammed with boluses made of fine barley flour. Cramming has been tried in Britain, but the improvement was not sufficiently great to repay the additional cost for labour. During the fatting process the birds must be kept as quiet as possible, and it is inadvisable to admit strangers more than can be avoided.

Food should be withheld from the turkeys for thirty hours before they are killed, so as completely to empty the intestines. The usual method of killing a turkey is first to fasten the legs and wings with soft string, which should be strong enough to bear the weight. By means of that fastening, suspend the bird from a beam, head downwards, so that the head will fall about midway on the operator's body. Pass the left arm around the turkey's body, so that its tail will point behind. Take its head in the right hand, with fingers under the throat, and thumb at the base of the skull. Now give a sharp, sudden, strong jerk downwards, and a sharp twist upwards and sideways, and death will be instantaneous, though there may be a considerable muscular action for some time. If it is thought desirable to bleed, this can be secured by cutting the throat, but it must be done quickly.

Turkeys are plucked (and this is better done immediately after death) all over the body and neck to within three inches of the head, except that the feathers are left on the back of the wings and the top of the rump. The wings are crossed over the turkey's back, forming a pad upon which the bird rests. In Normandy it is customary to tie the body up in fine linen cloths soured in skim milk, which explains the smooth skin and compact appearance of French turkeys. A small point like this means much. Some of the smaller East Anglian feeders follow the same plan, the universal adoption of which

should do much to remove the comparisons made in favour of foreign supplies.

Where a large number are killed, a second, but not so good a method, is to pack tightly on a shelf with the heads hanging in front, cover with a linen cloth, lay a broad deal along the breasts of the birds and weight heavily, the result of which is to throw up the breast meat. Turkeys sent in the usual way to market should never be drawn. Feathers should be carefully preserved. Good quills may be sold for 2*l.* per cwt., and body feathers at 1*l.* per cwt., but tail feathers will often realise 1*s.* per pound.

A most important point, but one which has not received proper attention, is that before the birds are packed the body heat must have passed, otherwise they will reach their destination in a deteriorated condition. Many complaints are made every year as to neglect of this precaution. Chilling poultry is as necessary as cooling milk which has to travel. How long this process takes depends upon the temperature of the air in which they are kept. Under no circumstances, if sent to any distance, should they be packed in less than twelve hours after killing, and it is much safer to let them remain over night, packing in the early morning. Hundreds of pounds in hard cash are annually sacrificed through despatching too soon. The birds should also be carefully graded. Packages should not contain more than a dozen birds. All should be of the same sex and weight, and it is better to use non-returnable wooden cases, upon which can be denoted the number and weight of the contents.

DISEASES.

Bowel complaints in turkey chicks, and what is called "swelled head" in more matured specimens, are the chief disease troubles the turkey raiser has to meet. But I do not think the latter is so common in this country as in America. The former is due to natural debility, to chills, to bad conditions, or to unsuitable food, and can only be prevented by greater care and wiser methods of management. "Swelled head" is, in many cases, a form of tuberculosis, due to tainted soil or bad water. Chickens bred from healthy stock, reared under the "open air system," and given fresh ground are unaffected. The worst case I ever saw was explained by the fact that turkeys had been reared for fifteen years on the same ground, which had become "turkey sick," and charged with disease. Here again "prevention is better than cure."

EDWARD BROWN.

The Chestnuts,
Theale, Berkshire.

STATISTICS AFFECTING BRITISH AGRICULTURAL INTERESTS.

THE tables printed on pp. 366-379 are compiled from the official publications of the Board of Agriculture, including the Agricultural Returns for 1903 [Cd. 2131]; the Acreage and Live Stock Returns for 1904, issued last October; the preliminary statements as to produce of crops and yield per acre for 1904; the Board of Agriculture Journal; and Vol. I. of the Annual Statement of the Board of Trade. Where not otherwise stated, the figures are taken from the Agricultural Returns and the Statements of the Board of Agriculture.

THE SIZE OF AGRICULTURAL HOLDINGS.

In 1895, the Board of Agriculture instituted a special inquiry into the size, distribution, and character of the Agricultural Holdings of Great Britain, and the results were published in a Parliamentary paper of 1896 [C. 8243]. Its main features were summarised in the Journal, Vol. 58, 1897, pp. 569, 570. A similar inquiry, but of more limited scope, was made by the Board in 1903; and the tables relating to it are given in the Agricultural Returns for 1903, and are the subject of comment by Major Craigie in his Annual Report prefixed thereto. The results show no very great changes in the relative size of holdings, but they indicate some increase in the number of medium-sized farms (*i.e.*, those between 50 and 300 acres). The number of farms of smaller and of larger size than this show some diminution, especially those of over 300 acres.

The following Table gives the Classification of the Agricultural Holdings of Great Britain, as revealed by the Returns of 1903, the corresponding figures for 1885 and 1895 being added for purposes of comparison. It will be noted that for the group of "Above one acre and not exceeding five acres," the

Classification of Agricultural Holdings of Great Britain.

Groups of Holdings		1885	1895	1903	Increase + or decrease — in 1903, as compared with 1885	Increase + or decrease — in 1903, as compared with 1895
Above acres	and not exceeding acres					
1	5	135,736 ¹	117,968	111,357	—	—6,611
5	50	232,955	235,481	232,892	—63	—2,589
50	300	144,288	147,870	150,955	+5,767	+2,185
300		19,364	18,787	18,081	—1,283	—706
Total.		532,343	520,106	512,385	—19,958	—7,721

¹ Including returns of holdings of exactly one acre.

figures of 1895 and 1903 are not strictly comparable with those of 1885, the latter including holdings of exactly one acre, which were not included in the Agricultural Returns after 1892.

Taking all the groups into calculation, it appears that the present average size of holdings in Great Britain remains practically the same as in 1895, viz., 63 acres; or, to take the figures as extended to decimals, 63·1 acres in 1903, as against 62·6 acres in 1895. If, however, the first group of holdings, viz., "Above one acre and not exceeding five acres" be eliminated—which for reasons explained in Major Craigie's Report makes the resulting figures more representative of ordinary agriculture—the average acreage of farms in different Divisions of Counties in England, in each of the three countries, England, Wales, and Scotland, and in the whole of Great Britain, is as follows:—

DIVISIONS OF COUNTIES	1885	1895	1903
	Aeres	Aeres	Aeres
I. Eastern and North Eastern	103	102	102
II. South Eastern and East Midland	98	95	94
III. West Midland and South Western	87	86	85
IV. Northern and North Western	64	65	66
ENGLAND as a whole	85	84	84
WALES	58	57	55
SCOTLAND	83	81	81
GREAT BRITAIN	81	80	80

ESTIMATED YIELD OF CROPS IN GREAT BRITAIN, 1903.

The following observations are reproduced from the Agricultural Returns of 1903, and the Acreage and Live Stock Returns of 1904:—

Wheat.—The yield per acre of wheat in Great Britain was estimated at 30·13 bushels per acre, or only two-fifths of a bushel less than the average of the preceding ten years, but this, in conjunction with the smaller area from which the crop was taken, reduced the total production to a figure below that of any year since 1895. The decline in the average yield was not everywhere apparent. In several counties the decennial average appears to have been exceeded. But while nearly a third of the area under wheat in Great Britain lies in the four contiguous counties of Essex, Suffolk, Norfolk, and Lincoln, in only one of these counties, Norfolk, was the estimated yield of 1903 over the decennial mean, and there the wheat crop was reported to have been on the whole of fair quality although generally harvested in bad condition. Taking the country generally the effect upon the wheat crop of the unfavourable harvest weather was very marked. The quality of the grain varied very considerably, a large portion of it being damp and quite unfit for market until it had been well dried in stack. In Kent, Surrey, and Sussex, as well as in Cornwall, Devon, and Dorset, the estimated yield was fairly satisfactory as

regards quantity, but it was more or less below the average throughout the western and northern counties. On the small area under wheat in Wales and on the still smaller area in Scotland, the yield was reported as slightly under the average in the one case, and considerably so in the other.

Barley.—The yield of barley was relatively more unsatisfactory than that of wheat, being four-fifths of a bushel below the average, while the quality was prejudicially affected by the weather to an even greater degree. Here again the results in the eastern counties appear to have been variable, but out of 797,000 acres under barley in this division only about one-fourth bore a crop which was estimated above the average. The counties thus favourably circumstanced were Bedford, Cambridge, and Suffolk, but even in these counties much of the crop was reported as damp and discoloured, and fit only for feeding purposes. The influence of the weather may be traced in the fact that the districts from whence the most favourable reports of the wheat crop were received were also those wherein the yield of barley was most satisfactory. Thus Cornwall reports a barley crop considerably above its normal average, while Devon and Dorset in the south-west, and Kent and Sussex in the south-east, seemed to have been favoured in comparison with the northern and western counties generally. In Northumberland, where barley occupies 32,000 acres, the estimated yield was only $26\frac{2}{3}$ bushels per acre, as compared with a local decennial average of $36\frac{1}{2}$ bushels, and in Wilts., where a similar area is grown, the deficiency was 5 bushels per acre. The Welsh crop of barley was generally poor, notwithstanding the fact that Pembroke, where more barley is grown than in the remaining Welsh counties, seems to have obtained over average results. In Scotland the yield generally fell below the average by the same amount as in England.

Oats.—Oats now occupy by far the largest portion of the area under cereals in Great Britain, and the yield of this crop in the past year was much more abundant than that of either wheat or barley, being $39\frac{3}{4}$ bushels per acre, or about one bushel in excess of the decennial average. In England the estimated yield was about 42 bushels per acre, or two bushels above the average. In five counties an average yield of over 50 bushels per acre was indicated, viz., Lincoln, Norfolk, Cambridge, Sussex, and Dorset. Generally the wet summer was not so injurious to the growth of this cereal as to that of wheat and barley, although the quality and condition were, of course, seriously affected. In the northern counties the crops were generally under average. The position in Wales was exactly the reverse of that in England, the estimated yield being $2\frac{1}{4}$ bushels below the average, Pembroke alone rising above the mean. In Scotland an average of $36\frac{1}{4}$ bushels per acre was obtained as the result of moderately bulky crops in the eastern counties, set off by under average returns from the northern and western divisions.

Beans and Peas.—The area under beans in Great Britain was 238,861 acres, and the estimated yield was 4.12 bushels above the average. In Suffolk and Lincoln, where comparatively large areas are devoted to this crop, good results were obtained, and it was reported to be the only grain crop that did well in the latter county. Beans are but little cultivated in Scotland, and the small area yielded crops $1\frac{1}{2}$ bushels below the average. A similarly unsatisfactory result was obtained in the North of England generally. The acreage under peas, like that of beans, is nearly all in England, where the production was above the average, but poor results were recorded in Lincoln, Essex, and Norfolk, counties which comprise more than one-third of the English area.

Potatoes.—The potato crop of the past year was very indifferent, the estimated average being only 5.16 tons as against 5.57 tons in 1902. In only four counties of England and Wales was the crop reported as exceeding the decennial average. The main crop in the important potato-growing county of Lincoln was much diseased, and badly harvested owing to the wet condition of the land. In Lancashire a large extent of land was reported to be unproductive from the same cause, the tubers rotting in the ground. One result has been to create an active demand for disease-resisting sorts for seed. In

Scotland the position appears to have been somewhat more satisfactory than south of the Border, though a good deal of disease is reported in the crop. In the southern counties the results were summarised by one estimator as follows: "The crop was a partial failure owing to cold, too much wet, and want of sun. Growers began to lift the crop late in the autumn under unfavourable conditions, and on heavy soils it was thought that an appreciable proportion of the crop would be unfit for table use."

Root Crops.—The estimated yield per acre of turnips and swedes in 1903 coincides precisely with the average of the preceding ten years for England. In Norfolk, which contains the largest acreage of any county in England, the yield was more than 2 tons below the average, the growth being retarded by the absence of sun. In Lincoln, where the area is nearly as great, the results were better, though similar conditions interfered to some extent with the maturing of the crop, and the feeding properties of the roots are said not to be so good as last year. In Wales the crop was half a ton, and in Scotland $1\frac{3}{4}$ tons, below the average. Mangels were estimated at 18 tons per acre in England, or rather more than the decennial mean. In most of the eastern counties the yield was unsatisfactory, but in the western and southern districts the crops did fairly well.

Hay.—Some compensation for the generally unsatisfactory harvest of other crops was obtained by the comparatively successful ingathering of the hay from clover, sainfoin, and other seeds, which yielded about 4 cwt. per acre in excess of the average in England. All the English counties showed good results except the northern group comprising Lancaster, Cumberland, Westmorland, Northumberland, and Durham. Fair weather during the latter part of June and the beginning of July enabled the first cut of "seeds" to be secured in good order, but the second cut was much damaged by the wet weather, and in many cases completely spoilt. In Wales the crop was four-fifths of a cwt. below the average. In Scotland the cold spring retarded the growth of the crop which yielded less than 29 cwt. per acre as compared with an average of nearly 32 cwt. The result in the case of hay from permanent pasture in England was very similar to that of clover hay, a yield of nearly $26\frac{1}{2}$ cwt. being secured, and where harvested early got in good condition. Low-lying lands suffered much from floods and consequent damage to the crops. In Scotland the yield fell below the average by 1·4 cwt. per acre, and the crop, in addition to being generally light, was not secured in good condition.

Hops.—The yield of hops, 8·78 cwt. per acre, showed an increase of 2·30 cwt. over the low yield of the previous year, a result which fell short of the decennial average by only 0·18 cwt. The yield of the county of Kent is now separately shown for each of the three divisions, East Kent, Mid Kent, and the Weald. In the Mid Kent district a crop averaging 11 cwt. per acre was estimated.

CROPS OF THE UNITED KINGDOM.

By the addition of the figures for Ireland the total production of the chief crops in the United Kingdom as a whole may be shown side by side for the past three years.

Estimated Total Produce of Crops in the United Kingdom.

CROPS	1901	1902	1903
	Qr.	Qr.	Qr.
Wheat	6,741,000	7,285,000	6,102,000
Barley	8,455,000	9,305,000	8,164,000
Oats	20,147,000	23,023,000	21,618,000
	Tons	Tons	Tons
Potatoes	7,043,000	5,920,000	5,277,000
Turnips	25,298,000	29,116,000	23,523,000
Mangels	9,224,000	10,809,000	8,212,000
Hay (all sorts)	11,358,000	15,246,000	14,955,000

ACREAGE UNDER PRINCIPAL CROPS AND GRASS IN 1904.

Wheat.—The decrease in the wheat area, amounting to 13 per cent., reduces the acreage under this cereal to 1,375,284 acres, which is the smallest area ever recorded. The lowest point to which the cultivation of wheat had been previously reduced was in 1895, when 1,417,483 acres were returned, but a recovery took place in the three succeeding years until in 1898 the area reached 2,102,206 acres. Since then, except for a slight check in 1902, the wheat acreage has year by year declined, and the tendency in that direction was accelerated in 1904, as in 1903, by the unfavourable conditions prevalent in the preceding autumn for preparing the land and planting the crop. Whatever the causes, it must be considered noteworthy that one-third of the acreage returned as under wheat so recently as in 1898 is now devoted to other crops. The largest losses in the present year, numerically, occur in Lincoln and in Essex, where 25,985 and 21,015 acres less are returned, or 16·4 and 20·9 per cent. of the respective wheat areas of these counties. Only two counties in England, viz., Dorset and Hants, and only Midlothian of the regular wheat-growing counties in Scotland, show any increase in the wheat area.

Barley shows a decrease of 17,800 acres, making the area under this crop also the smallest on record. The decline occurs mostly in Scotland, and it is also heavier in Wales than in England, where it amounted to only 1,775 acres or 0·1 per cent. In some counties the decline in barley is attributed to an unfavourable seeding time, while in others this cereal largely took the place of wheat. In Lincoln there is an increase of 14,289 acres, and considerably larger areas were also placed under this crop in Yorkshire. On the other hand the largest decrease, 7,467 acres, occurred in Norfolk. No Welsh and very few Scotch counties show an increase.

Oats, on the other hand, exhibit an increase of 112,720 acres, or 3·6 per cent., thus raising the figures for this crop higher than in any previous year with the exceptions of 1894 and 1895. It may be noticed that this, which has long been the most widely cultivated cereal crop in this country, now occupies for the first time in Great Britain an area larger than that under wheat and barley combined. Oats this year have to a considerable extent taken the place of wheat. In Scotland the increase is relatively slight, nearly half of it occurring in Aberdeenshire, while in Wales there is an actual decline. In England, Cornwall, Stafford, and Hants show decreases, but in every other county there are increases, the largest being in Essex and Norfolk, with, in each instance, some 10,000 acres more than in 1903.

Rye, Beans, and Peas.—A fall of 3,350 acres brings the total area under rye down to 55,714 acres. The area in any county being small (Norfolk, Suffolk, and Hants being the only counties with over 4,000 acres), the changes are not regularly distributed, many counties, of which Norfolk is the chief, recording an increase. Beans are most largely grown in the eastern counties of England; and the more important of these (Suffolk, Lincoln, Essex, Cambridge, and Norfolk) together show a gain of 14,454 acres. In the remaining counties the decreases are not quite balanced by the gains, so that the net result for Great Britain is a rise of 13,127 acres only, or 5·5 per cent. Peas, on an area rather less than three-fourths that of beans, show a decrease generally, amounting to 5,903 acres, or 3·3 per cent.

Potatoes occupy an area of 570,209 acres, or 5,923 more than in 1903. This increase has taken place almost entirely in Scotland, where there are 6,371 acres (of which 1,089 are in Perth) more than last year, while in Wales there is a decline of 483 acres. The majority of English counties show a decline in area (amounting to as much as 1,488 acres in Cambridgeshire) balanced by gains of 4,674 acres in Lincoln, the most considerable potato growing county, 1,122 acres in Stafford, 867 acres in Lancaster, and smaller increases in a few other counties. The substantial increase in Lincolnshire is partly attributed by the collectors to the encouragement afforded by the success of certain new varieties.

TABLE I.—*Acreage under Crops and Grass; and Number of Live 1904 and 1903, in each Division of Great Britain, with*

Crops and Grass	England		Wales		
	1904	1903	1904	1903	
	Acres	Acres	Acres	Acres	
Total Area of Land and Water	32,551,808	32,551,808	4,777,133	4,777,133	
Total Acreage under Crops and Grass	24,630,092	24,651,379	2,798,880	2,800,401	
CORN CROPS:—					
Wheat	1,302,404	1,497,254	35,144	43,197	
Barley or Bere	1,543,579	1,545,354	96,341	99,080	
Oats	2,059,983	1,953,866	212,240	213,266	
Rye	49,458	52,460	1,228	1,380	
Beans	240,645	226,750	1,235	1,292	
Peas	173,793	179,458	917	1,059	
TOTAL	5,369,862	5,455,142	347,105	359,274	
GREEN CROPS:—					
Potatoes	402,760	402,725	29,714	30,197	
Turnips and Swedes	1,091,344	1,085,339	61,039	61,038	
Mangel	385,646	388,063	10,212	10,259	
Cabbage, K. Rabi and Rape	159,088	162,713	4,189	4,474	
Vetches or Tares	118,480	135,819	877	955	
Other Green Crops	152,700	163,440	1,390	1,349	
TOTAL	2,310,018	2,338,099	107,421	108,272	
Clover, Sainfoin, and Grasses under Rotation	For Hay Not for Hay	1,698,490 1,019,778	1,797,075 1,025,004	203,039 159,431	203,423 182,593
TOTAL		2,718,268	2,822,079	362,470	386,016
Permanent Pasture or Grass, not broken up in Rotation	For Hay Not for Hay	4,116,855 9,576,560	4,122,884 9,458,294	502,756 1,471,711	487,110 1,451,724
TOTAL		13,693,415	13,581,178	1,974,467	1,938,834
Flax	551	916	3	4	
Hops	47,799	47,938	—	—	
Small Fruit	70,612	68,968	1,263	1,230	
Bare Fallow	419,567	337,059	6,151	6,771	
LIVE STOCK	No.	No.	No.	No.	
Horses used solely for Agriculture	869,618	856,569	94,352	94,237	
Unbroken Horses:—one year and above	224,969	224,525	42,446	41,173	
Unbroken Horses:—Under one year	101,355	98,266	23,464	21,854	
TOTAL OF HORSES	1,195,942	1,179,360	160,262	157,264	
Cows and Heifers in-milk or in-calf	1,961,860	1,876,318	277,462	274,472	
Other Cattle:—					
Two years and above	1,034,419	1,068,241	83,931	86,567	
One year and under two	968,464	907,667	176,849	163,938	
Under one year	952,489	894,082	190,193	186,087	
TOTAL OF CATTLE	4,917,232	4,746,308	728,435	711,064	
Breeding Ewes	5,570,760	5,541,950	1,415,284	1,400,496	
Other Sheep:—					
One year and above	3,070,994	3,148,416	828,190	829,275	
Under one year	6,107,208	6,210,612	1,246,211	1,281,653	
TOTAL OF SHEEP	14,748,962	14,900,978	3,489,685	3,511,424	
Breeding Pigs	327,904	332,735	36,621	39,404	
Other Pigs	2,148,451	1,973,072	204,483	204,579	
TOTAL OF PIGS	2,476,355	2,305,807	241,104	243,983	

Stock (Horses, Cattle, Sheep, and Pigs), as returned on June 4, Particulars for Ireland and Total for the United Kingdom.

Scotland		Ireland		United Kingdom	
1904	1903	1904	1903	1904	1903
Acres	Acres	Acres	Acres	Acres	Acres
19,458,728	19,458,728	20,710,589	20,710,589	77,684,012	77,684,012
4,888,638	4,891,799	15,230,124	15,242,421	47,670,948	47,708,023
37,736	41,136	30,825	37,596	1,407,618	1,620,988
200,764	214,050	158,103	158,791	2,002,854	2,021,823
980,739	973,110	1,078,772	1,097,538	4,351,183	4,257,052
5,028	5,224	9,414	10,050	65,177	69,228
10,902	11,613	1,890	2,080	254,892	241,958
898	994	185	290	175,934	181,951
1,236,067	1,246,127	1,279,189	1,306,345	8,257,658	8,393,000
137,735	131,364	618,540	620,393	1,200,419	1,195,877
451,721	456,924	285,831	287,548	1,898,010	1,898,879
2,969	3,305	75,746	75,998	475,313	478,394
14,709	15,917	43,146	48,317	221,478	231,743
8,872	8,192	2,761	2,662	131,273	147,967
2,581	2,501	24,459	24,865	182,852	193,985
618,587	618,203	1,050,483	1,059,783	4,169,345	4,146,845
421,366	411,947	631,748	629,259	2,968,462	3,053,638
1,169,391	1,187,784	647,416	608,776	3,028,616	3,057,584
1,590,757	1,599,731	1,279,164	1,236,035	5,997,078	6,091,222
145,792	144,976	1,628,412	1,596,906	6,400,510	6,358,319
1,284,382	1,269,507	9,939,223	9,988,945	22,292,795	22,187,124
1,430,174	1,414,483	11,567,635	11,585,851	28,693,305	28,545,443
9	5	44,293	44,685	44,856	45,610
6,072	5,954	4,512	4,591	47,799	47,938
6,972	7,296	4,848	5,131	82,980	81,269
				437,927	356,715
No.	No.	No.	No.	No.	No.
156,277	155,642	369,785	364,639	1,497,274	1,477,991
33,956	31,423	93,498	89,327	396,288	387,817
13,799	13,465	68,980	69,856	208,271	204,136
2,4032	200,530	532,263	523,822	2,101,833	2,069,944
439,358	437,418	1,497,819	1,495,179	4,193,893	4,100,480
256,286	275,817	1,026,665	1,032,178	2,405,979	2,467,770
284,520	296,531	1,035,505	1,036,253	2,474,434	2,413,307
232,521	237,480	1,117,143	1,100,502	2,501,659	2,426,947
1,212,685	1,247,246	4,677,132	4,664,112	11,575,965	11,408,504
2,894,864	2,936,655	1,524,803	1,576,179	11,435,887	11,485,423
1,414,418	1,482,198	722,565	729,501	6,040,674	6,197,158
2,659,249	2,808,542	1,580,516	1,633,924	11,628,513	11,976,282
6,968,531	7,227,395	3,827,884	3,944,604	29,105,074	29,658,863
17,531	17,761	133,541	147,807	517,621	540,003
126,654	119,010	1,181,982	1,235,709	3,674,471	3,545,805
144,185	136,771	1,315,523	1,383,516	4,192,092	4,085,808

TABLE II.—*Estimated Total Produce and Yield per Acre of the Principal Crops in England, Wales, Scotland, Great Britain, Ireland, and the United Kingdom for the years 1903 and 1902.*

Crops	England				Wales			
	Total produce		Yield per acre		Total produce		Yield per acre	
	1903	1902	1903	1902	1903	1902	1903	1902
Wheat	Bush. 45,102,329	Bush. 53,529,442	Bush. 30'12	Bush. 32'82	Bush. 1,059,229	Bush. 1,348,064	Bush. 24'59	Bush. 27'96
Barley	49,081,388	54,947,154	31'76	34'80	2,890,174	3,410,196	29'17	33'66
Oats	82,790,458	87,065,205	42'37	46'00	6,623,032	7,681,445	31'06	36'55
Beans	7,063,775	7,131,349	31'20	31'25	38,238	31,245	30'06	25'57
Peas	4,763,885	5,039,552	26'60	28'59	21,320	27,434	20'27	19'94
Potatoes	Tons 2,041,023	Tons 2,225,569	Tons 5'07	Tons 5'39	Tons 131,846	Tons 155,508	Tons 4'37	Tons 4'95
Turnips	12,996,608	16,023,633	11'97	14'67	873,684	1,005,208	14'31	16'50
Mangel	6,983,763	9,072,616	18'00	21'29	154,937	198,242	15'10	18'32
Hops	Cwt. 421,063	Cwt. 311,041	Cwt. 8'78	Cwt. 6'48	Cwt. —	Cwt. —	Cwt. —	Cwt. —
Hay from clover, sainfoin, &c.	56,941,209	57,123,299	31'69	32'87	4,567,076	5,920,302	22'45	28'35
Hay from permanent pasture	09,007,844	110,467,298	26'44	27'79	8,662,669	10,029,186	17'78	21'16
Hay of all kinds	65,949,053	167,590,597	—	—	13,229,745	15,949,488	—	—
Scotland								
Wheat	Bush. 1,481,258	Bush. 1,799,277	Bush. 36'01	Bush. 38'07	Bush. 47,642,816	Bush. 56,676,783	Bush. 30'13	Bush. 32'83
Barley	7,502,478	8,137,256	35'05	35'52	59,474,041	66,494,606	32'00	34'82
Oats	35,267,698	35,637,032	36'24	37'34	124,681,188	130,383,682	39'70	42'65
Beans	348,317	438,881	31'24	33'99	7,450,330	7,601,475	31'19	31'37
Peas	17,918	28,327	26'20	25'94	4,803,123	5,095,313	26'56	28'51
Potatoes	Tons 740,844	Tons 813,111	Tons 5'64	Tons 6'27	Tons 2,913,713	Tons 3,194,188	Tons 5'16	Tons 5'57
Turnips	6,507,168	7,140,609	13'26	15'67	19,927,460	24,169,450	12'43	15'02
Mangel	49,055	76,554	14'84	16'68	7,187,755	9,347,412	17'90	21'17
Hops	Cwt. —	Cwt. —	Cwt. —	Cwt. —	Cwt. 421,063	Cwt. 311,041	Cwt. 8'78	Cwt. 6'48
Hay from clover, sainfoin, &c.	11,921,099	13,878,813	28'94	33'21	73,429,384	76,922,414	30'44	32'53
Hay from permanent pasture	3,961,549	3,967,753	27'46	30'17	121,632,062	124,464,237	25'58	27'17
Hay of all kinds	15,882,648	17,846,566	—	—	195,061,446	201,386,651	—	—
Ireland								
Wheat	Bush. 1,175,972	Bush. 1,601,660	Bush. 31'28	Bush. 36'20	Bush. 48,818,788	Bush. 58,278,443	Bush. 30'15	Bush. 32'91
Barley	5,833,644	7,944,597	36'75	47'32	65,309,685	74,439,203	32'38	35'83
Oats	48,259,367	53,800,679	43'97	49'72	172,940,555	184,184,361	40'81	44'50
Beans	84,984	102,491	40'86	44'22	7,535,314	7,703,966	31'27	31'49
Peas	8,622	10,295	29'73	29'67	4,811,745	5,105,608	26'56	28'51
Potatoes	Tons 2,363,236	Tons 2,725,731	Tons 3'81	Tons 4'33	Tons 5,276,949	Tons 5,919,919	Tons 4'45	Tons 4'92
Turnips	3,595,745	4,946,774	12'50	17'15	23,523,205	29,116,224	12'44	15'35
Mangel	1,024,085	1,461,968	13'48	18'97	8,211,840	10,809,380	17'19	20'85
Hops	Cwt. —	Cwt. —	Cwt. —	Cwt. —	Cwt. 421,063	Cwt. 311,041	Cwt. 8'78	Cwt. 6'48
Hay from clover, sainfoin, &c.	27,085,040	27,817,060	43'18	46'10	100,514,424	104,739,474	33'07	35'29
Hay from permanent pasture	76,958,220	75,715,540	48'19	48'38	198,590,282	200,179,777	31'27	32'57
Hay of all kinds	04,043,260	103,532,600	—	—	299,104,706	304,919,251	—	—
United Kingdom								
Wheat	Bush. 48,818,788	Bush. 58,278,443	Bush. 30'15	Bush. 32'91	Bush. 48,818,788	Bush. 58,278,443	Bush. 30'15	Bush. 32'91
Barley	65,309,685	74,439,203	32'38	35'83	65,309,685	74,439,203	32'38	35'83
Oats	172,940,555	184,184,361	40'81	44'50	172,940,555	184,184,361	40'81	44'50
Beans	7,535,314	7,703,966	31'27	31'49	7,535,314	7,703,966	31'27	31'49
Peas	4,811,745	5,105,608	26'56	28'51	4,811,745	5,105,608	26'56	28'51
Potatoes	Tons 5,276,949	Tons 5,919,919	Tons 4'45	Tons 4'92	Tons 5,276,949	Tons 5,919,919	Tons 4'45	Tons 4'92
Turnips	23,523,205	29,116,224	12'44	15'35	23,523,205	29,116,224	12'44	15'35
Mangel	8,211,840	10,809,380	17'19	20'85	8,211,840	10,809,380	17'19	20'85
Hops	Cwt. 421,063	Cwt. 311,041	Cwt. 8'78	Cwt. 6'48	Cwt. 421,063	Cwt. 311,041	Cwt. 8'78	Cwt. 6'48
Hay from clover, sainfoin, &c.	100,514,424	104,739,474	33'07	35'29	100,514,424	104,739,474	33'07	35'29
Hay from permanent pasture	198,590,282	200,179,777	31'27	32'57	198,590,282	200,179,777	31'27	32'57
Hay of all kinds	299,104,706	304,919,251	—	—	299,104,706	304,919,251	—	—

TABLE III.—*Preliminary Statement showing the Estimated Total Produce and Yield per Acre of the Principal Crops in Great Britain in the year 1904, and the Average Yield per Acre in Great Britain of the Ten Years, 1894-1903.*

Crops	England		Wales		Scotland		Great Britain		Average of ten years, 1894-1903 Great Britain
	Total produce	Yield per acre	Total produce	Yield per acre	Total produce	Yield per acre	Total produce	Yield per acre	
Wheat . . .	Bush. 34,535,897	Bush. 26'52	Bush. 890,800	Bush. 25'41	Bush. 1,453,549	Bush. 38'53	Bush. 36,880,246	Bush. 26'82	Bush. 30'95
Barley . . .	47,028,421	30'47	2,983,409	30'97	7,181,237	35'77	57,193,067	31'07	33'17
Oats . . .	84,078,623	40'82	7,426,363	34'39	35,902,862	36'61	127,407,848	39'17	39'06
Beans . . .	5,435,245	22'61	29,851	24'27	363,079	34'53	5,828,175	23'12	28'25
Peas . . .	4,447,763	25'78	19,728	21'61	15,375	26'74	4,482,866	25'77	26'29
Potatoes . .	Tons 2,462,613	Tons 6'11	Tons 143,964	Tons 4'84	Tons 981,677	Tons 7'13	Tons 3,588,254	Tons 6'29	Tons 5'75
Turnips . .	14,240,944	13'05	1,000,805	16'40	7,794,380	17'25	23,036,129	14'36	12'79
Mangels . .	7,252,440	18'81	180,615	17'69	48,347	16'28	7,481,402	18'76	18'30
Hay ¹ . . .	Cwt. 50,851,945	Cwt. 29'94	Cwt. 5,052,234	Cwt. 24'88	Cwt. 14,037,089	Cwt. 33'31	Cwt. 69,941,268	Cwt. 30'11	Cwt. 29'13
Hay ² . . .	102,806,640	24'97	10,224,964	20'34	4,482,312	30'93	117,513,916	24'66	23'63

¹ Hay from clover, sainfoin, &c.² Hay from permanent pasture.TABLE IV.—*Preliminary Statement showing the Estimated Total Production of Hops in the Years 1904 and 1903, with the Acreage and Estimated Average Yield per Statute Acre, in each County of England in which Hops were grown.*

COUNTIES	Estimated total produce		Acreage		Estimated average yield per acre	
	1904	1903	1904	1903	1904	1903
Hants . . .	Cwt. 9,137	Cwt. 17,648	Acres 1,900	Acres 1,920	Cwt. 4'81	Cwt. 9'19
Hereford . .	14,101	41,333	6,767	6,851	2'08	6'03
Kent . . .	216,807	289,724	29,841	29,933	7'27	9'68
Salop . . .	280	862	140	133	2'00	6'48
Surrey . . .	2,515	8,281	877	901	2'87	9'19
Sussex . . .	27,726	36,178	4,474	4,454	6'20	8'12
Worcester . .	11,736	26,668	3,752	3,697	3'13	7'21
Other Counties ¹ .	28	374	48	49	0'58	7'63
Total . . .	282,330	421,068	47,799	47,938	5'91	8'78

NOTE.—The following counties show *decreased acreages* in 1904 to the extent named:—Hants, 20 acres; Hereford, 84 acres; Kent, 92 acres; Surrey, 24 acres; other counties, 11 acres. The *increases* are Salop, 7 acres; Sussex, 20 acres; Worcester, 55 acres. The effective decrease on the year is 139 acres.

¹ Gloucester and Suffolk.

TABLE V.—*Average Prices of British Corn per Imperial Quarter in England and Wales, as ascertained under the Corn Returns Act, 1882, in each Week of the Year 1903.*

Week ended	Wheat	Barley	Oats	Week ended	Wheat	Barley	Oats
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
January 3 . . .	25 0	23 11	16 10	July 4 . . .	27 9	20 7	18 6
January 10 . . .	24 11	24 1	17 0	July 11 . . .	28 1	19 11	18 3
January 17 . . .	24 11	24 1	16 10	July 18 . . .	28 3	20 5	18 7
January 24 . . .	25 0	24 1	16 11	July 25 . . .	28 7	20 10	18 5
January 31 . . .	25 4	24 3	17 0	August 1 . . .	28 11	21 0	18 6
February 7 . . .	25 6	23 9	16 11	August 8 . . .	29 3	20 1	18 8
February 14 . . .	25 6	23 7	17 1	August 15 . . .	29 11	21 3	18 10
February 21 . . .	25 4	23 4	17 1	August 22 . . .	29 9	20 4	18 6
February 28 . . .	25 3	23 2	17 1	August 29 . . .	30 0	22 3	18 7
March 7 . . .	25 3	23 1	17 1	September 5 . . .	30 3	22 5	18 5
March 14 . . .	25 1	21 10	17 0	September 12 . . .	28 6	22 4	17 0
March 21 . . .	25 1	22 9	16 10	September 19 . . .	27 5	24 2	16 4
March 28 . . .	25 2	22 4	17 0	September 26 . . .	27 0	24 0	16 2
Average of quarter ended Lady-day	25 2	23 5	16 11	Average of quarter ended Michaelmas	28 8	21 6	18 0
April 4 . . .	25 3	22 6	17 0	October 3 . . .	26 3	23 9	15 9
April 11 . . .	25 4	21 10	17 2	October 10 . . .	25 10	23 8	15 6
April 18 . . .	25 6	21 6	17 3	October 17 . . .	25 8	23 9	15 5
April 25 . . .	26 1	21 9	17 9	October 24 . . .	25 10	23 7	15 8
May 2 . . .	26 10	22 1	18 0	October 31 . . .	26 0	24 2	15 8
May 9 . . .	27 6	21 10	18 2	November 7 . . .	26 4	24 3	15 9
May 16 . . .	27 9	22 5	18 4	November 14 . . .	26 6	24 6	15 9
May 23 . . .	27 10	23 7	18 5	November 21 . . .	26 9	24 3	15 10
May 30 . . .	27 8	23 7	18 5	November 28 . . .	26 6	23 11	15 11
June 6 . . .	27 6	23 10	18 4	December 5 . . .	26 8	23 9	15 9
June 13 . . .	27 8	21 5	18 7	December 12 . . .	29 7	23 2	15 9
June 20 . . .	27 6	20 7	18 3	December 19 . . .	26 9	23 0	15 7
June 27 . . .	27 6	22 0	18 6	December 26 . . .	26 5	22 5	15 6
Average of quarter ended Midsummer	26 11	22 2	18 0	Average of quarter ended Christmas	26 3	23 8	15 8

TABLE VI.—*Quantities and Values of Corn Imported into the United Kingdom in the Years 1901, 1902, and 1903.*

[From Annual Statement of Trade, 1903.]

	Quantities			Values		
	1901	1902	1903	1901	1902	1903
CORN:	Cwt.	Cwt.	Cwt.	£	£	£
Wheat	69,708,530	81,002,227	88,131,030	23,081,372	27,079,823	29,940,191
Wheat meal and flour	22,576,430	19,386,341	20,601,448	10,341,519	8,925,617	9,723,652
Barley	21,873,430	25,210,955	26,575,446	6,163,012	7,136,321	7,239,751
Oats	22,470,670	15,857,167	16,283,763	6,347,719	5,041,323	4,263,950
Peas	2,042,711	2,035,110	1,829,923	747,168	740,123	690,768
Beans	1,868,560	2,065,593	1,765,700	629,831	703,659	594,832
Maize	51,372,700	44,492,977	50,099,328	12,387,225	11,713,132	12,465,583
Oatmeal and groats	840,335	612,602	728,973	546,132	486,241	537,415
Maize meal	1,638,026	242,841	590,416	457,345	83,270	176,622
Other kinds of corn and meal	1,733,017	1,415,923	1,360,350	473,967	389,672	370,731
TOTAL OF CORN	196,124,409	192,321,736	207,966,377	61,175,290	62,299,181	65,994,495

TABLE VII.—Average Prices per Imperial Quarter and Quantities of British Corn returned as sold in the Towns in England and Wales from which Returns were received under the Corn Returns Act, 1882, in each of the Years 1894 to 1903.

Year	Wheat		Barley		Oats	Wheat	Barley	Oats
	s.	d.	s.	d.	s.	Qrs.	Qrs.	Qrs.
1894	22	10	24	6	17 1	1,956,824	2,729,348	565,747
1895	23	1	21	11	14 6	1,928,383	3,426,576	665,939
1896	26	2	22	11	14 9	2,111,021	3,391,862	655,153
1897	30	2	23	6	16 11	2,756,561	3,257,187	550,434
1898	34	0	27	2	18 5	2,602,416	3,653,657	688,064
1899	25	8	25	7	17 0	3,530,961	3,296,744	776,361
1900	26	11	24	11	17 7	2,923,483	3,190,793	711,784
1901	26	9	25	2	18 5	2,605,550	3,369,629	714,215
1902	28	1	25	8	20 2	2,247,937	2,783,424	831,285
1903	26	9	22	8	17 2	2,296,723	2,875,749	1,049,995

TABLE VIII.—Annual and Septennial Average Prices per Imperial Bushel of British Wheat, Barley, and Oats in each Year from 1894 to 1903 inclusive, with the Value of 100l. of Tithe Rent-charge.

Year	Annual average price			Septennial average price			Value of tithe rent-charge of 100 <i>l.</i>											
	Wheat		Barley	Oats	Wheat		Barley	Oats	Calculated on annual average			Calculated on septennial average						
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>		
1894	2	10½	3	0¾	2	1½	3	9	3	4	2	3½	65	1	11½	73	15	0½
1895	2	10½	2	8¾	1	9¾	3	7	3	2¾	2	3	58	12	0½	71	9	6¾
1896	3	3¼	2	10¾	1	10	3	6½	3	2	2	2¼	61	15	8¾	69	17	11½
1897	3	9¼	2	11¼	2	1½	3	5¾	3	1	2	2	68	2	10¾	68	14	11
1898	4	3	3	4¾	2	3½	3	5½	3	0¾	2	1¾	76	11	0½	68	2	4¾
1899	3	2½	3	2¼	2	1½	3	4½	3	0½	2	1	67	16	7½	66	15	9¾
1900	3	4¼	3	1¼	2	2¼	3	4¼	3	0½	2	0¾	68	11	7¼	66	10	9¼
1901	3	4	3	1¾	2	3½	3	5½	3	0½	2	1	70	1	10¾	67	3	8¾
1902	3	6	3	2½	2	6¼	3	6¼	3	1¼	2	2¼	74	3	9½	69	7	5
1903	3	4	2	10	2	1¾	3	6½	3	1¼	2	2¾	65	13	10¾	69	19	6

TABLE IX.—Average Prices of Wool in each of the Years 1897 to 1903.

Year	ENGLISH				AUSTRAL-ASIAN ³	SOUTH AFRICAN ³
	Leicester ¹	Half-breds ¹	Southdown ¹	Lincoln ²		
	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.
1897	d. 8¾ to 10	d. 8¾ to 9¾	d. 8¾ to 0 10½	d. 9½	d. 8	d. 7½
1898	" 8 " 8¾	" 7¾ " 8¾	" 8¼ " 0 9¾	" 8¾	" 8½	" 7¾
1899	" 7 " 8	" 7 " 8¼	" 7¾ " 0 11	" 8¼	" 9¾	" 7¾
1900	" 6¼ " 7½	" 6¾ " 8¾	" 8 " 1 0	" 7¾	" 11	" 8¾
1901	" 5½ " 6	" 5½ " 9¼	" 7¼ " 0 9¼	" 6¾	" 8¼	" 7
1902	" 5 " 5½	" 5¾ " 6¾	" 7½ " 0 9½	" 6¼	" 8½	" 7¾
1903	" 6½ " 6¾	" 7 " 8	" 8½ " 0 11½	" 7¼	" 9½	" 7½

¹ Computed from the prices given weekly in *The Economist* newspaper.

² Prices extracted from "The Yorkshire Daily Observer Wool Tables."

³ Calculated from the Trade and Navigation Accounts.

TABLE X.—*Number of Cattle, Sheep, and Swine reported as entering the Scheduled Markets of Great Britain under the Markets and Fairs (Weighing of Cattle) Act, 1891, together with the Numbers Weighed and Priced.*

[From the Board of Agriculture Journal, Vol. viii., p. 551, and Vol. x., p. 560.]

Animals	1901	1902	1903
CATTLE:	No.	No.	No.
Entering markets	1,161,516	1,302,601	1,262,301
Weighed	156,289	184,499	183,466
Prices returned	131,792	145,996	147,903
Prices returned with quality distinguished }	109,590	121,453	123,946
SHEEP:			
Entering markets	4,314,232	4,508,045	4,223,877
Weighed	39,371	42,832	36,679
Prices returned with quality distinguished }	32,439	34,695	30,810
SWINE:			
Entering markets	383,875	414,351	483,232
Weighed	2,167	2,722	3,034
Prices returned with quality distinguished }	2,161	2,585	2,996

TABLE XI.—*Average Prices of Fat Cattle per cwt. (Live Weight) for 1902 and 1903. Compiled from the Returns received under the Markets and Fairs (Weighing of Cattle) Act, 1891.*

Places	Inferior or third quality		Good or second quality		Prime or first quality	
	1902	1903	1902	1903	1902	1903
	Per cwt. s. d.	Per cwt. s. d.	Per cwt. s. d.	Per cwt. s. d.	Per cwt. s. d.	Per cwt. s. d.
ENGLAND:						
Carlisle	27 6	27 6	31 0	30 8	35 6	35 6
Leeds	—	—	33 2	31 10	36 4	35 6
Leicester	31 4	—	31 10	31 0	35 10	34 2
Liverpool	28 2	26 6	32 0	30 2	36 2	34 6
London	29 2	28 8	36 2	33 10	40 6	37 10
Newcastle	—	—	34 4	33 4	39 8	37 6
Shrewsbury	29 6	30 0	33 4	33 10	37 4	36 2
SCOTLAND:						
Aberdeen	26 8	26 6	35 8	34 6	39 0	37 2
Dundee	26 2	25 0	36 0	34 6	39 8	37 8
Edinburgh	—	32 0	37 2	35 4	40 0	37 8
Falkirk	31 4	30 8	35 0	34 10	38 4	37 2
Glasgow	35 6	34 4	36 10	35 10	38 4	36 8
Perth	31 4	31 2	35 2	34 4	39 0	37 4

TABLE XII.—Number of Live Stock (Horses, Cattle, Sheep, and Pigs) Imported into Great Britain from Ireland and Exported from Great Britain to Ireland in each of the Three Years, 1901 to 1903.

Live Stock	Imports from Ireland			Exports to Ireland		
	1901	1902	1903	1901	1902	1903
	No.	No.	No.	No.	No.	No.
HORSES—Stallions . . .	194	222	265	191	247	257
Mares . . .	11,467	11,143	12,867	4,725	3,754	3,953
Geldings . . .	13,946	13,895	14,587	5,633	4,255	4,368
TOTAL . . .	25,607	25,260	27,719	10,549	8,256	8,578
CATTLE—Oxen } Fat . . .	261,690	306,892	246,887	—	2	15
} Store . . .	344,954	556,554	556,506	549	644	612
Bulls and Cows } Others . . .	6,269	10,634	6,724	—	2	—
Calves . . .	29,725	85,161	87,528	62	63	39
TOTAL . . .	642,638	959,241	897,645	611	711	666
SHEEP—Sheep . . .	484,516	599,319	444,762	20,639	16,627	31,790
Lambs . . .	358,809	456,483	380,917	10,606	6,793	12,742
TOTAL . . .	843,325	1,055,802	825,679	31,245	23,420	44,532
PIGS—Fat . . .	559,232	603,108	541,601	2	3	1
Store . . .	36,897	34,864	28,319	42	25	22
TOTAL . . .	596,129	637,972	569,920	44	28	23

TABLE XIII.—Value of Agricultural Machinery and Implements Exported from the United Kingdom in each of the Five Years 1899 to 1903. [From Annual Statement of Trade, 1903.]

Agricultural	1899	1900	1901	1902	1903
STEAM ENGINES :	£	£	£	£	£
To British possessions . . .	62,940	59,380	58,754	72,019	144,703
„ Foreign countries . . .	698,589	696,125	562,214	559,717	731,398
Total . . .	761,529	755,505	620,968	631,736	876,101
MACHINERY NOT STEAM :					
To British possessions . . .	113,889	106,550	88,467	113,074	159,201
„ Foreign countries . . .	831,130	766,086	644,481	698,927	820,063
Total . . .	945,019	872,636	732,948	812,001	979,264
IMPLEMENTS AND TOOLS :					
To British possessions . . .	164,949	158,895	156,296	189,529	210,093
„ Foreign countries . . .	244,096	225,149	237,481	235,616	256,015
Total . . .	409,045	384,044	393,777	425,145	466,108
Total of agricultural machinery and implements . . .	2,115,593	2,012,185	1,747,693	1,868,882	2,321,473

TABLE XIV.—Quantities of Wheat, and of Wheat Meal and Flour, Imported into the United Kingdom in each of the Four Years, 1900 to 1903; also the Countries from which they were obtained. [*From Annual Statement of Trade, 1903.*]

—	1900	1901	1902	1903
WHEAT from—	Cwt.	Cwt.	Cwt.	Cwt.
Russia . . .	4,478,300	2,541,500	6,540,457	17,176,300
Germany . . .	1,828,300	594,700	239,910	310,176
Turkey . . .	131,200	406,400	345,525	433,004
Roumania . . .	756,100	512,100	2,362,453	3,140,727
United States. .	32,588,470	40,466,300	43,312,561	24,197,895
Chile . . .	2,500	—	251,446	238,644
Argentina . . .	18,524,000	8,080,400	4,315,165	14,120,454
Brit. E. Indies .	6,100	3,341,500	8,841,586	17,057,857
Australasia . .	3,788,200	6,820,800	4,331,379	230
Canada . . .	6,337,600	6,691,710	9,527,475	10,802,127
Other countries .	228,720	253,120	934,270	653,616
TOTAL WHEAT .	68,669,490	69,708,530	81,002,227	88,131,030
WHEAT MEAL AND FLOUR from—	Cwt.	Cwt.	Cwt.	Cwt.
Germany . . .	36,154	34,300	16,208	37,020
France . . .	755,848	534,570	713,935	577,498
Austria-Hungary .	1,167,955	799,588	688,962	817,879
United States. .	17,877,308	18,999,882	15,587,217	16,223,639
Canada . . .	1,195,219	1,358,100	1,943,213	2,637,617
Other countries .	515,647	819,990	436,806	307,795
TOTAL WHEAT MEAL AND FLOUR .	21,548,131	22,576,430	19,386,341	20,601,448

TABLE XV.—Quantities and Values of Fruit, Vegetables, and Hops Imported into the United Kingdom in the Years 1901, 1902, and 1903. [*From Annual Statement of Trade, 1903.*]

—	Quantity			Value		
	1901	1902	1903	1901	1902	1903
	Cwt.	Cwt.	Cwt.	£	£	£
Apples . . .	1,830,210	2,843,517	4,569,546	1,182,782	1,923,474	2,781,643
Strawberries . .	38,604	40,211	32,644	51,290	58,080	49,362
Cherries . . .	212,683	166,359	110,192	213,585	216,421	167,142
Plums . . .	263,700	541,136	594,626	243,705	515,059	622,268
Pears . . .	348,886	491,906	271,518	296,411	439,536	326,463
Grapes . . .	679,885	632,932	684,084	694,942	676,992	715,057
Oranges . . .	5,281,657	6,518,107	6,176,752	2,119,728	2,358,708	2,275,400
Lemons, &c. . .	1,071,534	1,003,298	978,318	434,514	417,152	406,728
Unenum'd (raw) .	535,247	500,679	688,873	302,013	308,998	449,413
	Bushels	Bushels	Bushels			
Onions . . .	7,295,418	7,605,489	8,619,919	869,397	999,942	1,003,016
	Cwt.	Cwt.	Cwt.			
Potatoes . . .	7,076,726	5,699,090	9,150,202	1,851,587	1,589,432	2,603,238
Tomatoes . . .	793,995	783,894	1,071,927	733,471	700,126	953,192
Vegetables, raw, unenumerated .	—	—	—	389,829	468,411	396,784
Hops . . .	116,042	191,324	113,998	461,355	798,586	578,739

TABLE XVI.—*Number and Value of Live Horses, Cattle, Sheep, and Swine Imported into the United Kingdom in the Years 1901, 1902, and 1903.*

[From Annual Statement of Trade, 1903, and Agricultural Returns, 1903.]

Imported from	Number			Value		
	1901	1902	1903	1901	1902	1903
HORSES :				£	£	£
Canada . . .	1,500	1,869	421	46,737	51,838	14,631
Denmark . . .	565	1,202	3,014	17,236	40,211	89,448
France . . .	1,322	1,694	1,215	128,708	168,668	131,712
Germany . . .	1,259	2,999	508	18,670	56,219	8,503
Holland . . .	1,719	2,822	1,971	58,870	92,082	69,044
Russia . . .	10,754	11,440	12,801	107,445	114,854	134,554
United States .	19,360	7,146	3,150	659,299	264,519	119,951
Other countries	4,377	3,514	4,186	58,718	47,378	63,412
TOTAL .	40,856	32,686	27,266	1,095,683	835,769	631,255
CATTLE :						
Channel Islands	1,720	1,380	1,721	31,650	25,574	31,035
Canada . . .	88,211	93,674	190,812	1,484,860	1,644,478	3,315,762
United States .	405,703	324,423	301,747	7,324,154	6,144,629	5,399,210
Argentina . . .	—	—	27,807	—	—	455,535
Uruguay . . .	—	—	—	—	—	—
TOTAL .	495,634	419,477	522,087	8,840,664	7,814,681	9,201,542
SHEEP & LAMBS :						
Canada . . .	68,010	55,033	83,291	99,506	86,501	129,045
United States .	300,152	233,227	171,386	463,519	361,736	264,416
Argentina . . .	—	—	82,941	—	—	134,239
Iceland and Greenland .	15,432	4,943	16,623	23,114	6,185	18,363
Uruguay . . .	—	—	—	—	—	—
TOTAL .	383,594	293,203	354,241	586,139	454,422	546,063
TOTAL VALUE OF LIVING ANIMALS FOR FOOD }	—	—	903,594	9,426,803	8,269,103	10,378,860

TABLE XVII.—*Number and Value of Live Horses, Cattle, Sheep, and Swine Exported from the United Kingdom in the Years 1901, 1902, and 1903.*

[From Annual Statement of Trade, 1903.]

Exported to	Number			Value		
	1901	1902	1903	1901	1902	1903
HORSES :				£	£	£
Canada . . .	139	215	370	11,537	23,136	34,065
United States . . .	574	795	588	70,383	90,231	76,630
Belgium . . .	15,743	16,058	19,332	223,610	196,440	240,091
France . . .	2,034	2,013	2,490	95,626	109,253	140,415
Germany . . .	1,028	929	786	39,841	41,100	32,828
Holland . . .	7,141	8,957	9,741	77,100	81,619	83,854
Russia . . .	43	11	44	3,358	970	4,280
Other countries . .	910	1,054	1,447	84,244	92,912	122,435
TOTAL .	27,612	30,032	34,798	605,699	635,661	734,598
CATTLE :						
Channel Islands . .	269	103	—	4,250	3,025	—
Canada . . .	402	574	151	16,462	24,048	6,159
United States . . .	506	760	225	17,403	27,678	6,808
Argentina . . .	1	104	536	100	12,065	55,854
Other countries . .	470	887	1,824	23,597	29,337	71,423
TOTAL .	1,648	2,428	2,736	61,812	96,153	140,244
SHEEP AND LAMBS :						
Australasia . . .	233	471	190	5,689	6,561	2,292
Canada . . .	567	155	117	3,834	2,370	390
United States . . .	212	635	142	1,494	4,384	1,134
Argentina . . .	23	327	2,465	810	3,979	43,219
Germany . . .	502	429	507	4,552	4,254	4,754
Other countries . .	1,224	1,579	2,158	9,348	7,521	15,969
TOTAL .	2,761	3,596	5,579	25,727	29,069	67,758
PIGS :						
British possessions . .	95	176	256	755	1,658	2,495
Foreign countries . .	283	339	520	2,682	3,395	4,558
TOTAL .	378	515	776	3,437	5,053	7,053

TABLE XVIII.—Quantities and Values of Dead Meat Imported into the United Kingdom in the Three Years, 1901 to 1903.

[From Annual Statement of Trade, 1903.]

DEAD MEAT		1901		1902		1903	
		Quantities	Values*	Quantities	Values	Quantities	Values
BACON:		Cwt.	£	Cwt.	£	Cwt.	£
	From United States . . .	4,244,329	9,255,851	3,283,855	8,239,522	2,893,507	7,370,928
	" Denmark . . .	1,060,909	3,234,456	1,255,627	3,749,108	1,496,101	4,294,017
	" Canada . . .	398,697	921,509	462,487	1,203,280	665,249	1,691,687
	" Other countries . . .	68,413	178,360	87,735	235,057	102,131	262,508
	Total . . .	5,772,348	13,590,176	5,089,704	13,426,967	5,156,988	13,619,140
BEEF:							
Salted	From United States . . .	192,000	246,927	143,994	227,283	165,176	232,293
	" Other countries . . .	12,396	20,429	9,580	16,719	8,516	13,312
	Total . . .	204,396	267,356	153,574	244,002	173,692	245,605
Fresh	From United States . . .	3,180,291	6,761,587	2,290,465	5,204,057	2,693,920	5,739,750
	" Australasia . . .	471,474	745,296	303,117	533,115	237,486	393,758
	" Other countries . . .	856,981	1,399,956	1,113,805	2,167,892	1,228,200	2,232,633
	Total . . .	4,508,746	8,906,839	3,707,387	7,905,064	4,159,606	8,366,141
HAMS:							
	From United States . . .	1,730,536	4,209,816	1,312,779	3,422,004	939,169	2,602,654
	" Canada . . .	125,867	304,822	168,930	423,319	197,497	524,542
	" Other countries . . .	4,267	13,750	5,578	16,578	4,666	15,378
	Total . . .	1,860,670	4,528,388	1,482,287	3,858,902	1,141,332	3,142,574
MEAT (unenumerated):							
Salted or fresh.	From Holland . . .	284,790	616,411	291,059	623,619	269,541	571,762
	" United States . . .	174,830	275,913	163,348	259,900	179,212	283,766
	" Other countries . . .	150,651	228,123	200,616	315,591	214,508	350,524
	Total . . .	610,271	1,120,447	655,023	1,199,110	663,261	1,206,052
Preserved, otherwise than by salting.	Beef . . .	464,727	1,289,893	578,426	1,710,383	472,615	1,511,846
	Mutton . . .	64,884	168,143	85,496	206,562	49,154	106,328
	Other sorts . . .	239,737	824,269	247,434	869,249	245,794	817,603
	Total . . .	769,348	2,282,305	911,356	2,786,194	767,563	2,435,777
MUTTON:							
Fresh.	From Australasia . . .	2,006,856	3,902,252	1,914,171	3,762,290	2,116,703	4,518,653
	" Argentina . . .	1,271,654	1,950,599	1,352,501	2,273,027	1,485,770	2,603,931
	" Holland . . .	316,285	711,550	343,759	780,520	257,521	580,673
	" Other countries . . .	13,434	33,679	49,168	99,074	156,628	122,805
	Total . . .	3,608,229	6,598,080	3,659,599	6,914,911	4,016,622	7,826,062
PORK:							
Salted (not hams).	From United States . . .	137,680	207,856	105,416	187,131	90,849	158,318
	" Other countries . . .	109,367	116,312	99,843	118,453	146,725	160,938
	Total . . .	247,047	324,168	205,259	305,584	237,574	319,256
Fresh.	From Holland . . .	377,061	800,729	353,398	752,089	527,269	1,122,202
	" Belgium . . .	40,482	98,122	34,656	83,722	39,745	97,990
	" United States . . .	348,935	762,993	252,421	572,328	132,695	319,634
	" Other countries . . .	25,031	53,789	14,901	38,006	6,135	15,626
	Total . . .	791,509	1,715,633	655,376	1,446,145	705,844	1,555,452
RABBITS:							
	From Australasia . . .	289,157	359,475	341,037	420,127	378,043	445,485
	" Belgium . . .	72,363	205,325	77,555	226,300	68,716	197,950
	" Other countries . . .	30,347	84,026	32,865	87,899	28,886	80,446
	Total . . .	391,867	648,826	451,457	734,326	475,645	723,881
TOTAL OF DEAD MEAT		18,664,431	39,982,218	16,971,022	38,821,205	17,498,127	39,439,949

TABLE XIX.—Quantities and Values of Butter, Margarine, Cheese, Milk, Poultry, and Eggs Imported into the United Kingdom in each of the Years 1901, 1902, and 1903; also the Countries from which they were obtained. [From Annual Statement of Trade, 1903.]

	Quantities			Values		
	1901	1902	1903	1901	1902	1903
BUTTER :	Cwt.	Cwt.	Cwt.	£	£	£
From Sweden . . .	180,212	191,591	212,232	938,889	995,838	1,108,980
„ Denmark . . .	1,597,450	1,703,621	1,772,761	8,951,663	9,304,841	9,577,939
„ Germany . . .	26,983	26,375	12,507	150,206	145,399	65,165
„ Holland . . .	298,912	393,261	343,761	1,511,564	1,973,930	1,718,692
„ France . . .	311,601	414,240	454,088	1,704,128	2,233,122	2,351,402
„ New South Wales	59,597	17,621	20,371	293,917	88,256	99,629
„ Victoria . . .	186,141	62,519	98,177	921,505	312,578	469,168
„ New Zealand . .	167,343	157,993	249,879	819,534	781,872	1,245,022
„ Canada . . .	215,588	285,765	185,437	1,008,002	1,347,345	866,249
„ United States . .	150,126	54,458	42,405	689,164	252,874	190,678
„ Other countries .	508,937	667,489	709,076	2,308,824	3,090,635	3,105,783
Total . . .	3,702,890	3,974,933	4,060,694	19,297,396	20,526,690	20,798,707
MARGARINE :						
From Norway . . .	7,787	6,067	5,210	20,553	14,918	12,987
„ Holland . . .	908,964	914,323	843,016	2,395,630	2,409,257	2,188,461
„ France . . .	30,710	34,731	28,795	107,217	117,853	99,751
„ Other countries .	14,666	11,049	5,102	33,279	27,475	12,419
Total . . .	962,127	966,170	882,123	2,556,679	2,569,503	2,313,618
CHEESE :						
From Holland . . .	315,923	284,020	302,503	747,013	668,308	706,832
„ France . . .	26,833	36,801	36,004	83,880	113,611	113,531
„ Australasia . . .	79,243	51,882	56,399	193,868	131,054	168,071
„ Canada . . .	1,547,739	1,709,565	1,848,142	3,697,660	4,301,859	4,823,090
„ United States . .	540,102	390,479	360,916	1,274,061	962,112	953,215
„ Other countries .	76,997	73,465	90,394	230,653	235,058	289,971
Total . . .	2,586,837	2,546,212	2,694,358	6,227,135	6,412,002	7,054,710
MILK (condensed)	919,319	914,675	915,717	1,760,516	1,807,351	1,738,931
MILK AND CREAM (other than condensed)	24,293	22,030	22,487	42,327	37,613	41,176
Total . . .	943,612	936,705	938,204	1,802,843	1,844,964	1,780,107
POULTRY (and game) :						
From Russia . . .	—	—	—	180,750	218,459	324,087
„ Belgium . . .	—	—	—	234,135	281,063	275,173
„ France . . .	—	—	—	229,586	225,284	254,888
„ Other countries .	—	—	—	336,286	334,238	348,140
Total . . .	—	—	—	980,757	1,059,044	1,202,288
EGGS :	Great Hundreds	Great Hundreds	Great Hundreds			
From Russia . . .	4,492,110	5,339,045	6,802,773	1,207,474	1,509,754	1,866,421
„ Denmark . . .	3,019,414	3,518,212	3,851,557	1,160,948	1,366,073	1,648,367
„ Germany . . .	2,971,777	3,931,280	3,087,748	895,624	1,260,871	994,797
„ Belgium . . .	2,575,642	2,627,457	2,291,262	805,241	827,914	725,680
„ France . . .	1,805,196	1,680,433	1,601,930	696,125	717,474	670,104
„ Canada . . .	704,033	517,822	557,080	255,956	209,316	218,571
„ Other countries .	1,503,595	1,352,546	1,656,544	474,399	417,583	493,659
Total . . .	17,071,767	18,966,795	19,848,894	5,495,767	6,308,985	6,617,599

TABLE XX.—Quantities and Values of Wool, Wood, Seeds, Manures, &c., Imported into the United Kingdom in the Years 1901, 1902, and 1903. [*From Annual Statement of Trade, 1903.*]

	Quantities			Values		
	1901	1902	1903	1901	1902	1903
WOOL: Sheep and Lambs'	Lb.	Lb.	Lb.	£	£	£
	686,956,308	637,129,733	599,500,932	21,504,577	19,924,255	20,622,523
WOOD AND TIMBER:	Loads	Loads	Loads			
Hewn . . .	2,772,895	2,810,724	3,237,418	5,450,052	5,435,204	6,379,954
Sawn or split, planed or dressed . .	6,281,000	6,676,726	6,742,233	16,319,014	17,171,422	18,192,519
Staves . . .	140,064	119,902	129,773	730,521	668,630	570,859
SEEDS:	Cwt.	Cwt.	Cwt.			
Clover & grass	281,129	337,802	458,046	611,618	740,387	1,008,772
Cotton . . .	Tons	Tons	Tons			
	437,149	550,620	537,491	2,705,597	3,285,650	2,984,096
Flax or linseed.	Qrs.	Qrs.	Qrs.			
Rape . . .	1,684,822	1,818,829	2,185,694	4,263,931	4,486,997	4,179,727
	163,329	228,278	308,296	298,426	385,708	417,271
MANURES:	Tons	Tons	Tons			
Bones (burnt or not) . . .	57,748	58,973	52,996	220,024	224,123	232,592
Guano . . .	22,830	29,293	32,801	104,909	186,926	180,891
Nitrate of soda	107,108	114,952	116,715	910,067	1,067,570	1,079,982
Phosphate of lime and rock.	354,890	364,859	392,782	551,717	553,922	560,707
Unenumerated.	98,241	104,321	110,167	179,262	186,523	200,553
MISCELLANEOUS:	Cwt.	Cwt.	Cwt.			
Cotton, raw . .	16,336,697	16,220,874	16,009,813	41,970,539	41,149,202	44,836,116
Hay . . .	Tons	Tons	Tons			
	199,976	357,041	167,408	800,133	1,359,967	556,942
Straw . . .	40,315	79,571	72,680	99,808	206,650	167,013
Flax . . .	75,565	73,420	94,701	3,070,000	2,944,390	3,675,664
Hemp . . .	136,215	115,069	116,717	4,122,219	3,913,094	3,551,431
Linen yarn . .	Lb.	Lb.	Lb.			
	23,468,952	28,158,012	28,993,021	764,299	968,332	1,019,027
Hides, raw:	Cwt.	Cwt.	Cwt.			
Dry . . .	353,087	286,334	291,670	987,132	845,484	877,663
Wet . . .	757,175	661,198	493,748	1,782,779	1,595,109	1,229,727
Leather . . .	1,323,833	1,198,864	1,124,277	8,321,677	8,095,637	8,090,349
Petroleum . .	Gallons	Gallons	Gallons			
	253,784,746	284,809,710	283,862,633	5,070,702	5,193,582	5,295,351
Lard . . .	Cwt.	Cwt.	Cwt.			
	1,966,256	1,650,830	1,732,790	4,037,689	4,118,992	3,870,774
Oil-seed Cake .	Tons	Tons	Tons			
	379,599	387,667	367,791	2,413,646	2,472,938	2,165,430

[Continued from page 365.]

Root Crops, &c.—Turnips and swedes show a small increase (of 803 acres, or 0·1 per cent.) for the first time since 1893. The change is, however, very unevenly distributed; in England there is a net increase of 6,005 acres, chiefly in Suffolk, though many counties show a decline; but in Scotland there is a general decrease, amounting altogether to 5,203 acres. Mangels, on the other hand, show a small decline of 2,800, acres or 0·7 per cent. As with turnips, the tendency has been diverse in the different districts, the chief mangel growing county (Norfolk) recording an increase of 1,183 acres, while Essex has a decline of 1,263 acres, and Suffolk nearly as much. These changes in the root crops may probably be ascribed mainly to the character of the weather during the spring. Although cabbage, kohl-rabi, and rape show a total decrease of 5,118 acres, or 2·8 per cent., the chief decline occurs in the relatively small amount of kohl-rabi, the area of which fell from 19,297 acres in 1903 to 15,607 this year, or by 19·1 per cent.

Grass and Clover.—A decline of 136,331 acres, or 2·8 per cent., appears in the area returned as under clover and rotation grasses. The decrease is greatest in England and almost universal in Wales, but several Scotch counties show an increase, and the net decrease north of the Tweed is relatively small. The most important reductions occur in Suffolk and Lincoln, each of which returns 10,000 acres less than in 1903. Of the total area about half was mown for hay, but there is a greater relative decrease in the mown than in the grazed area. Permanent grass shows an increase of 163,561 acres, or 1 per cent.; and the total for Great Britain now exceeds 17,000,000 acres. The area mown for hay amounted to rather more than a quarter of the total, and showed a relatively small increase of 10,433 acres. In England, there was a decrease of 6,029 acres in the hay area, which was, however, more than counterbalanced by a rise of 15,646 acres in Wales, and a small increase in Scotland. The whole area intended for hay, whether under rotation or in permanent grass, amounts to 7,088,298 acres, as compared with 7,167,415 acres in 1903, or a decline in the total hay area of 79,117 acres.

NUMBERS OF LIVE STOCK IN GREAT BRITAIN IN 1904.

Horses.—The total number of horses included in the Returns—viz., horses used for agricultural purposes, mares kept for breeding, and unbroken horses—is the largest hitherto recorded, surpassing by nearly 8,000 the number returned in 1896. The increase, as compared with 1903, amounts to 23,082, or 1·5 per cent. Practically all counties shared in the increase. Proportionately, the increase is greatest among unbroken horses under one year, which may be taken as some indication of the progress of breeding. For the whole country the increase in this class amounted to 3·8 per cent., but it was relatively most marked in Wales, where it amounted to 7·4 per cent., as compared with 3·1 in England and 2·5 in Scotland.

Cattle.—Except for the year 1892, when 6,944,783 were returned, the number of cattle in 1904 is the highest total ever shown in Great Britain, the increase over 1903 amounting to 153,734, or 2·3 per cent. In England and Wales there is a large increase, the most substantial additions being noted in Kent, Devon, Sussex, and Lincoln, in the order named, and the most serious decline in any one county being a fall of 10,892 in Norfolk. On the other hand, only six Scotch counties show any augmentation, a net decline of 34,561 being noted north of the Border. There is a noteworthy advance among the cows and heifers in milk or in calf, which now amount to 2,678,680, or 90,472 more than in 1903, a number never previously equalled. This increase occurred mainly in England, the increase in the dairy herds of Scotland being less conspicuous. Cattle under one year, and those under two years, both show an even higher rate of increase than the cows. The increase of the younger stock is, however, confined to England and Wales, Scotland recording a decline in both categories. In the older cattle, there is a general decrease of 55,989, or 3·9 per cent., of which Norfolk was accountable for no less than 13,748.

Cumberland, Suffolk, the North and West Ridings of Yorkshire, Aberdeen, and Forfar also show material losses among the older portion of their herds.

Sheep have continued the decline that has been a marked feature in live stock statistics for many years past. On this occasion the diminution amounts to 432,619 head, or 1·7 per cent. of the total in 1903. The most important decreases occur in the north of England, *e.g.*, the three Ridings of York and Cumberland, and also in Lincoln. In Scotland the chief decreases are in Argyll, Perth, and Dumfries. Ewes kept for breeding have remained practically stationary, an increase south of the Tweed being almost counterbalanced by a decline in Scotland. The chief increase is in Kent, which accounts for exactly half the number added to the ewes in 1904 in England. Lambs, especially in Scotland, have decreased, the lambing season having been unfavourable in many districts, while in some cases the reduction in numbers is ascribed to a greater proportion of early sales. Sheep of one year and above, other than breeding ewes, have also fallen off, especially in Yorkshire, Lincoln, and Cumberland.

Pigs, of which the number fluctuates considerably from year to year, exhibit an increase of 175,083, or 6·5 per cent., which is generally distributed throughout the country. This is attributed in several counties to the reduction of swine fever. The largest increases occur in Yorkshire, Lincoln, and Norfolk, and the chief exception to the rule is Somerset. Sows kept for breeding, however, show a decline of 2 per cent.

THE WEATHER DURING THE AGRICULTURAL YEAR, 1903-1904.

FROM any ordinary point of view a year which included a summer of such unusual brilliancy as that of 1904 could scarcely have been regarded otherwise than as a distinct success. The farmer's standpoint is, however, very different from that of the casual observer. To him every portion of the year brings its anxieties—from the autumn, when mild, dry weather is needed for the preparation of the land and the early sowing, to the following summer, when sunshine and warmth, interspersed with occasional rains, are desired for the ripening of the grain and the due nourishment of the root crops. During the past season nature proved less kind in these respects than the average town dweller would, perhaps, have imagined.

The drenching rains of 1903 began to moderate a little towards the close of the year, but the succeeding winter had far more than its fair share of moisture. The soddened soil had therefore little opportunity of recovering from the ill effects it had previously sustained, much of the seed sown in the autumn being rotted before it had had time to germinate. In the spring the weather was drier, but, with a great absence of sunshine, the growing crops met with little encouragement, the latter part of the season being, however, sufficiently fine to lead to a good hay harvest, secured, for the most part, quickly,

and in excellent condition. The damage to the cereals was by this time beyond repair, all the brightness and warmth of the summer failing to compensate for the unfavourable influences of the winter and the early spring. The grain crops appeared in many places flourishing enough, and the weather at the time of harvest left little to be desired, but the actual yield was disappointing, the verdict "under the average" being returned from nearly all parts of the country. The autumn of 1904 was fortunately more propitious, so that at the time of writing the agricultural prospects for the ensuing season were much more favourable than they were at the commencement of 1904.

The rainfall of the past year presented a marked contrast with that of 1903. This will be seen very clearly by the table given on page 391. In 1903 almost every part of the country had a large excess, the wettest districts (as compared with the average) being the south of England, the north of Ireland, and the west of Scotland. Last year there was a very general deficiency, the only portions of the kingdom in which the rainfall exceeded the average being the coast stations in the south-west, the west, and the extreme north, from the Channel Islands and Cornwall, round by the west of Ireland, to the Hebrides and the Shetlands.

THE WINTER OF 1903-1904.

The winter of 1903-1904 was extremely changeable, with a general predominance of cold weather, but with very little in the way of severe frost. Snow was rather frequent, but occurred mainly in the form of showers, the absence of heavy storms of this nature being even more noticeable than in many milder seasons of recent years.

The coldest weather of the whole winter was experienced at the beginning of December and at the close of that month. In the former case the frost came with a northerly wind which spread over the country at the end of November. The lowest temperatures were recorded, as a rule, on December 2 or 3, when the sheltered thermometer fell to 10° or 12° below the freezing point in many parts of the country and to 14° below it at Swarraton, in Hampshire. On the 3rd a gale from the south-westward sprang up, and the thermometer rose rapidly, the change being accompanied by heavy rain in North Wales and the north-west of England. Two days later a thick fog was experienced in many districts, with a brief touch of frost, the thermometer in some places failing to rise above the freezing point all day. The second spell of cold was due to an easterly wind which spread over from the Continent soon after Christmas, the lowest temperatures being observed as a rule on or

about January 1, when the thermometer in many places fell as low, or slightly lower, than at the commencement of December. The frost appears to have been sharpest over our southern counties, the lowest temperatures recorded by sheltered thermometers being 12° at Bramley in Surrey, 17° at Wokingham, and 18° at Shaftesbury, in Dorsetshire.

With the exception of these two very cold spells the weather in December was usually mild and dull, with frequent gales in the western and southern parts of the kingdom. In the second week the weather was also very wet, the heaviest individual fall of rain occurring on December 12, when amounts varying between 1 in. and 1½ in. were experienced in many parts of Devon and Cornwall.

In January the weather was very similar in character to that which had prevailed throughout so large a portion of December. The highest temperatures, 55° to 59°, were experienced as a rule on the 12th or 13th, and on the latter date or the 14th thunder and lightning occurred in many parts of England. About the middle of the month, when the wind shifted temporarily to the north-westward and blew a gale, the weather became colder, with snow in all the more northern districts; while a little later the extension of a large anticyclone from the south-westward was followed by a sharp touch of frost, the thermometer falling between the 21st and 26th to 25° or less in many places. At the time the cold was greatest, *i.e.*, between the 21st and 23rd, a good deal of fog and mist prevailed, especially in the eastern and central districts. At the close of January a strong wind from south and south-west again spread over the country, with gales on the 28th and 29th, and with frequent rain in all districts.

During the earlier half of February the weather was more unsettled even than in January, the disturbing influence being seen in a series of cyclonic systems which advanced directly over the United Kingdom. In the southern districts, where the wind was chiefly from the westward or south-westward, the weather was fairly mild; but in the north, where the current was from east or north-east, the air was cold, with frequent snow showers between the 2nd and 8th. In all other parts of the country rain fell daily, the heaviest falls occurring on the 3rd in the northern and central districts, and on the 9th over our southern counties. On the 12th and 13th a gale of considerable severity from south and south-west swept over the whole country, heavy rain being experienced in the west, and thunder and lightning in many districts. The remainder of February was cold and very changeable. Snow was frequent, especially during the last five days, and at the close of the month a sharp frost occurred, the sheltered thermometer in

the north falling to at least 10° below the freezing point in several places, to 12° below it at Blackpool and Harrogate, and to 13° below it at Garforth.

Taken as a whole the mean temperature of the winter was below the average, the deficiency (greatest in the daytime) being due largely to a marked absence of sunshine. Over the country generally the winter was the duller experienced for at least ten years past, but in London it was not so cloudy as that of 1896-1897. Rain was more frequent than usual, and the total quantity was everywhere more than the average, the excess being slight in the north-eastern and eastern districts, but large in the south. In the south-western counties the excess amounted to 32 per cent., and in the southern counties to 35 per cent., while in the Channel Islands it was as much as 51 per cent. In some portions of the two last-mentioned districts the winter proved the wettest of recent years.

THE SPRING OF 1904.

The weather of the spring was rather changeable—cold throughout the greater part of March, but mild at the close of that month and in April, and cold again from the end of April until after the middle of May. The season was, however, characterised by a general deficiency of rain, and had there been more drying winds and a greater prevalence of sunshine the conditions would doubtless have been highly favourable for agricultural operations and the growth of vegetation. As it was, both these features were conspicuous by their absence, so that, in the earlier half of the spring especially, the land recovered but slowly from the waterlogged condition in which it had been left by the excessive rains of the previous twelve months. Later on matters improved somewhat, but even in May the general absence of sunshine was again marked, the only really fine week being the third in the month, when a splendid amount was recorded in all but the south-western districts.

March opened with easterly winds and a spell of very sharp frost, the sheltered thermometer falling below 25° in many districts. Snow showers were experienced during the first week in nearly all parts of the country, and thunder and lightning occurred in the south and east of England on the 8th and 9th. Towards the middle of the month the wind became more variable, but after a short burst of warmth about the 8th or 9th, the weather again turned cold, with sharp frost between the 10th and 12th, and again between the 15th and 18th, the thermometer falling once more to 25° or less in many places, and to 20° at one or two isolated stations in the south. Snow showers were experienced about these times in the northern

districts, but over the country generally the weather was fair and dry. Shortly after the middle of the month a mild current of air from west and south-west set in, with mild showery weather; but at the beginning of the fourth week cold easterly and north-easterly winds reappeared, with sharp night frosts in many places.

At the close of March and in the earlier part of April the wind was in the west, and often strong to a gale in force, the weather being generally rather mild, with frequent, but not heavy, falls of rain. On March 29 and 30 thunder and lightning occurred in many parts of England, and snow fell in most districts, while on April 3 and 4 thunderstorms occurred in the west, and showers of sleet were experienced in the north. Towards the middle of April winds from between south and east set in, with a continuance of changeable weather; but after the 17th a spell of variable breezes was reported, with little or no rain, and a considerable amount of bright sunshine. In the closing week the wind was again westerly to south-westerly, and the weather more cloudy, but mostly dry.

In the first ten days or so of May the country was under the influence of shallow cyclonic systems, which passed across from the westward, and occasioned heavy rains with thunderstorms in several places on the 6th. As these disturbances moved away a cold northerly wind set in, and between the 6th and the 8th sharp night frosts were general, with snow or sleet showers at many places in the west and north. Later on the wind got back to west or south-west, and for some time the temperature was about normal, rainfall and sunshine being both deficient. In the third week, however, when an anticyclone spread over the country from the south-westward, a spell of genuinely fine summer weather was experienced, the temperature recorded on the 16th being above 70° in most districts and slightly above 75° in North Wales. Thunderstorms occurred on the same day in several parts of the country. Towards the close of the month the anticyclone broke up, numerous small cyclonic systems advanced over us, and the weather again became very changeable, with heavy rain in the west and north on the 23rd. Thunderstorms occurred in many places on the 26th and 27th, and again on the 30th and 31st.

The mean temperature of the entire spring was below the average, the deficiency of warmth (greatest in the daytime) being again due very largely to the absence of sunshine. The duration of that element was in all districts, excepting the north-eastern, the smallest registered in the spring for at least ten years past. In the Channel Islands the mean

daily amount for the whole season was nearly one hour less than usual, while in the south-western district the daily deficiency was more than one hour. The rainfall of the spring agreed very closely with the average in all the more western parts of the country, but was deficient elsewhere. The driest district, both actually and relatively, was the eastern, where the total rainfall was 20 per cent. less than the normal, and smaller than in any recent spring with the exception of that of 1900.

THE SUMMER OF 1904.

The tendency in favour of fair, dry weather displayed in the spring months, and especially in the latter part of the season, became more marked during the progress of the summer. Until the concluding half of August the rainfall was almost constantly below the average, the only striking exception occurring in the last week of July, when a large amount was experienced in all parts of the country. In June the weather was as a rule rather cloudy, and temperature slightly below the average, but with the opening of July a period of hot, forcing sunshine set in, the second week being especially fine and warm. The warmth lasted, with little intermission, until the first week in August, when a change set in, the weather for the remainder of the summer being mostly cool and unsettled. Throughout the greater part of the summer the air appears to have been in a highly electrical condition, and thunderstorms were consequently frequent; while on the afternoon of July 3 an earthquake was experienced over the northern and central parts of England and Wales.

Early in June the weather was influenced by a large anti-cyclone, which spread over Western Europe from the southward, the wind being at first north-westerly, but afterwards north-easterly. In the west and north of England a considerable amount of bright sunshine was registered, but in the south and east the weather was generally cloudy, with thunderstorms on the 6th. After the end of the first week the anticyclone drifted away to the north-eastward, while an area of disturbed weather extended over Ireland and England, thunderstorms being experienced at many isolated places in the west and south between the 7th and 13th. Later on a decided improvement occurred, the general conditions being, however, still rather changeable, with thunder on the south and south-east coasts of England on the 17th. On the 24th and 25th a cyclonic disturbance moved eastwards directly across the country, its progress being attended by heavy rain, especially in the counties of Berwick and Northumberland, where the fall on the 24th amounted to between 1 in. and 1½ in. Thunderstorms were experienced on the same day in

the north of England, and on the 25th in many other parts of the country. As the depression passed away over the North Sea a cold northerly wind spread over England, and on the night of the 27th a slight ground frost occurred in parts of the northern and central districts. Throughout the whole of June the weather, though so often fair and dry, was never very warm, the highest shade temperature registered being only 80°, a reading observed at Maidenhead on the last day of the month.

With the commencement of July the conditions became more summer-like, and in the earlier half of the month the only serious exceptions to a fine warm spell were occasioned by thunderstorms which visited the northern and eastern counties on the 2nd and 3rd, Devon, Cornwall, and the Channel Islands on the 11th, and a more extended portion of the country on the 12th. The rainfall of the period was therefore slight, and temperature was usually above the average, the highest readings being observed between the 9th and 11th, or between the 15th and 17th, when the thermometer rose to 85° or more in several places. At Bramley and Maidenhead the shade reading on the 17th was as high as 91°. After the 18th the weather gradually became less settled, and between the 22nd and 27th thunderstorms and heavy rains occurred in all districts, the largest individual amounts being recorded between the 24th and 26th. On the 24th as much as 3·8 in. fell at Huddersfield, while on the 25th 2·3 in. fell at Bennington and 2·0 in. at Buxton. At the close of the month further thunderstorms occurred in several districts, the accompanying rainfall amounting on the 30th to 1½ in. or more in some parts of our eastern counties, and to as much as 2·2 in. at Hillington, of which 1·6 in. fell in thirty-five minutes.

At the beginning of August a short spell of fine, hot weather again set in, the thermometer rising on the 3rd or 4th to considerably above 80° in most places, to 90° at Margate, and to 91° in London and at Maidenhead. The heat was, however, followed quickly by severe thunderstorms, heavy local rains, and a decided fall of temperature, and until very nearly the close of the month the weather was rather cool,—mostly fair in the eastern and southern districts, but less settled in the west and north. A stiff gale from south-west and west prevailed in the western districts on the 6th, and again between the 13th and 14th; while on the 17th thunderstorms and heavy rain occurred in many parts of the country, the latter amounting to 1·9 in. at Cheadle and 1·6 in. at Aberystwyth. Between the 21st and 23rd further heavy rains were experienced in many places, with thunderstorms in the northern, eastern, and south-eastern counties; but at the close of August the weather became finer and warmer, the thermometer rising on the 30th to 80°

and upwards in many places. This burst of heat proved, however, quite as transient as that experienced at the commencement of the month, and on the 31st heavy rain was again reported in the east and south-east, the amount being as large as 1·9 in. at Tealby and 1·5 in. at Rauceby.

The mean temperature of the whole summer differed but little from the average, the night readings being, however, as a rule a trifle below the normal. Rain was less frequent than usual, and the aggregate amount was short of the average in all but the south-western districts, where the fall was about normal. In the east and south of England the summer rains did not amount to more than 81 per cent. of the average. Bright sunshine was unusually prevalent, especially in the south and in the north-west: in each of these districts the mean daily duration for the whole season exceeded the average by more than one hour. In many parts of the country the summer proved one of the sunniest of recent years, but in some districts it was less bright than in 1899.

THE AUTUMN OF 1904.

A spell of rather changeable weather in the earlier half of September was followed by a decided improvement, the latter half of the month and the first fortnight in October being mostly fine and dry, though rather cool. The concluding part of October was less fair, rainfall being still deficient, but the sky more cloudy, with a good deal of fog between the 19th and 21st. In November the weather became very changeable, while towards the middle of the month, when the conditions were quieter, a good deal of wet fog was experienced. In the third week an exceedingly cold air spread over the country from the northward, severe frost becoming general, with snow in all districts, the latter being very heavy in the north. Later on, when the north wind died away, fog reappeared over a large portion of the country, the tendency for this element being greater than in most recent years.

The first few days of September proved somewhat uneventful, but on the 6th and 7th of the month thunderstorms occurred in many parts of England, with heavy rain in the west. Towards the middle of the month a spell of dry easterly winds set in, with fairly high day temperatures, but with cool nights, ground frost being experienced on the nights of the 19th and 20th in many parts of the northern and eastern counties. In the closing week the conditions became rather less settled, thunderstorms being experienced in many isolated parts of the country, and heavy rain at places in the west and south-west on the 30th. Thick fogs were also experienced about this time over the inland districts.

The first week in October was very changeable. Exceedingly heavy rains fell in the Channel Islands and on some parts of our southern coasts on the 2nd, the amount being over 2 in. at Jersey, and nearly $2\frac{1}{2}$ in. at Guernsey. In the north the weather was at the same time fair and quiet, with a sharp ground frost at night, the exposed thermometer at Rauceby falling early on the 3rd to a minimum of 18° . A stiff westerly gale swept over the whole country on the 5th and 6th, with further heavy rains on the latter day, Guernsey again receiving more than an inch. After this an anticyclone spread over us and the weather improved decidedly, the days being fairly warm but the nights cold and frosty. Towards the middle of the month another unsettled spell set in, the wind being in the south-west and the thermometer high, especially on the 18th, when shade temperatures exceeding 65° were registered in most parts of England. On the 16th a heavy fall of rain occurred in Wales and Lancashire, the amount being as large as $1\frac{1}{2}$ in. at Stonyhurst and Llangammarch Wells, and over 2 in. at Bettws-y-Coed. Between the 19th and 21st a thick wet fog prevailed very generally, but for the remainder of the month the weather was mostly fair and dry, with a temperature slightly above the average.

November opened with mild and dry, but with very cloudy, weather, these conditions lasting with slight interruptions until after the middle of the month. On the 7th and 8th, however, when a strong gale from west and north-west prevailed over the entire country, considerable falls of rain were reported over our north-western districts, the aggregate amount at Stonyhurst for the two days being more than 3 in. : while from the 13th to the 18th there was much wet fog over the whole country, especially in the night and early morning hours. After the 19th a radical change took place, the wind shifting to the northward (and blowing a strong gale on the 22nd), with snow and bitterly cold weather in all districts. Over the northern and central parts of the kingdom the snowstorms of the 21st and 22nd were very heavy, and occasioned serious interruption to all kinds of traffic. In many places the temperatures registered between the 22nd and 27th were the lowest on record for the month of November, the sheltered thermometer falling below 15° over a considerable portion of the country, to 11° at Hereford, and to 8° at Cambridge. Between the 24th and 26th there were many spots in which the thermometer did not reach the freezing point all day, the coldness being aggravated by a fog which set in on the 24th and continued with short intervals until the 29th. At the close of the month a westerly breeze sprang up and the weather became milder.

[Continued on page 392.]

**Rainfall, Temperature, and Bright Sunshine experienced over
England and Wales during the whole of 1903 and 1904, with
Average and Extreme Values for Previous Years.**

Districts	RAINFALL									
	TOTAL FALL					NO. OF DAYS WITH RAIN				
	For 37 years, 1866—1902					For 22 years, 1881—1902				
	In 1904	In 1903	Average	Extremes		In 1904	In 1903	Average	Extremes	
				Driest	Wettest				Driest	Wettest
North-eastern	In. 21·0	In. 31·0	In. 25·8	In. 19·9 (1884)	In. 37·2 (1872)	164	197	186	162 (1884)	208 (1894)
Eastern	20·3	30·1	25·0	19·1 (1874 and 1887)	33·1 (1872)	164	178	181	156 (1898)	205 (1894)
Midland	23·6	34·4	27·7	19·2 (1887)	39·8 (1872)	173	194	177	148 (1887)	210 (1882)
Southern	26·5	35·8	28·4	21·5 (1887)	41·7 (1872)	177	197	171	137 (1899)	197 (1882)
North-western with North Wales	31·3	44·4	38·0	24·9 (1887)	50·2 (1872)	192	226	197	163 (1887)	222 (1882)
South-western with South Wales	37·5	48·6	42·1	28·3 (1887)	68·6 (1872)	196	221	198	159 (1887)	235 (1882)
Channel Islands ¹	35·8	38·7	32·4	26·2 (1887)	39·5 (1882)	228	241	211	169 (1899)	251 (1886)
Districts	MEAN TEMPERATURE					HOURS OF BRIGHT SUNSHINE				
	For 37 years, 1866—1902					For 22 years, 1881—1902				
	In 1904	In 1903	Average	Extremes		In 1904	In 1903	Average	Extremes	
				Coldest	Warmest				Cloudiest	Sunniest
North-eastern	° 48·1	° 47·7	° 47·4	° 45·0 (1879)	° 49·2 (1898)	1449	1275	1296	1006 (1885)	1558 (1893)
Eastern	49·1	49·3	48·4	45·8 (1879)	51·0 (1868)	1655	1445	1577	1267 (1888)	1864 (1899)
Midland	48·0	48·3	48·3	45·8 (1879)	51·1 (1868)	1385	1264	1408	1173 (1888)	1715 (1893)
Southern	49·7	50·2	49·6	45·9 (1879)	51·6 (1898)	1624	1531	1597	1245 (1888)	1983 (1899)
North-western with North Wales	48·0	48·6	48·5	45·9 (1879)	50·3 (1868 and 1893)	1442	1390	1377	1198 (1888)	1683 (1901)
South-western with South Wales	49·9	50·2	50·2	48·3 (1888)	52·8 (1868)	1539	1517	1664	1459 (1888)	1964 (1893)
Channel Islands ¹	52·2	52·5	52·2	50·7 (1885)	54·3 (1899)	1830	1754	1916	1710 (1888)	2300 (1893)

NOTE.—The above Table is compiled from information given in the Weekly Weather Report of the Meteorological Office.

¹ For the Channel Islands the "Averages" and "Extremes" of Rainfall and Mean Temperature are for the twenty-two years, 1881—1902.

The Rainfall of 1903 and 1904 and of the previous Eight Years, with the Average Annual Fall for a long period, as observed at thirty-eight stations situated in various parts of the United Kingdom.

Stations.	1904		1903		Rainfall of Previous Years								Average rain- fall
	Total rain- fall	Dif- ference from ave- rage	Total rain- fall	Dif- ference from ave- rage	1902	1901	1900	1899	1898	1897	1896	1895	
ENGLAND AND WALES:	In.	Per cent.	In.	Per cent.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Durham	190	-31	308	+12	185	229	288	245	208	218	245	276	276
York	208	-19	303	+18	187	205	258	224	237	244	222	258	256
Hillington	257	-6	356	+30	262	244	326	247	221	263	297	269	273
Yarmouth	210	-20	251	-5	214	212	247	224	200	208	213	233	264
Cambridge	176	-23	305	+34	158	167	197	193	179	204	207	228	228
Nottingham	232	-17	363	+29	196	211	271	251	187	250	290	254	281
Nottingham	200	-21	322	+27	215	204	285	226	195	234	230	208	253
Cheadle	263	-22	392	+17	264	277	375	309	278	328	293	295	336
Hereford	250	-7	378	+41	243	252	328	267	224	267	182	241	269
Cirencester	288	-8	411	+32	251	261	310	268	221	327	236	258	312
Oxford	227	-10	359	+42	167	223	236	210	191	263	235	225	253
London	202	-17	380	+56	204	215	222	220	178	233	227	214	244
Hastings	246	-16	323	+11	230	194	298	258	230	281	299	286	292
Southampton	310	...	432	+40	274	283	316	276	266	326	263	283	309
Stonyhurst	396	-17	589	+23	368	390	483	475	479	513	442	424	479
Manchester	320	-15	452	+20	265	333	428	335	332	391	384	342	378
Liverpool	251	-13	344	+19	256	251	319	276	256	284	266	262	288
Llandudno	260	-17	385	+23	250	287	328	324	313	307	304	301	312
Pembroke	318	-10	458	+30	309	330	406	350	355	381	307	311	353
Clifton	309	-12	428	+22	265	266	377	355	309	389	276	320	351
Cullompton	349	-2	427	+20	308	311	355	370	299	389	276	348	355
Plymouth	414	+14	458	+26	309	330	403	331	292	404	291	378	363
Scilly (St. Mary's)	344	+2	399	+19	253	326	341	319	271	357	258	299	336
Jersey (St. Aubin's)	373	+10	382	+13	304	296	346	263	300	362	332	347	339
² Mean for the whole of England and Wales }	280	-11	375	+19	267	274	323	286	262	313	285	290	316
SCOTLAND:													
Stornoway	557	+20	621	+33	463	428	625	599	716	452	590	443	466
Wick	253	-12	359	+26	264	321	331	297	274	219	347	329	286
Aberdeen	237	-23	363	+18	273	280	340	303	275	287	312	358	308
Braemar	249	-31	441	+23	318	314	405	356	365	368	302	327	360
Leith	234	...	309	+32	164	225	312	248	199	205	217	219	234
Marchmont	261	-24	386	+12	244	272	438	326	283	290	314	349	345
Fort Augustus	444	+4	660	+55	356	369	505	423	543	419	426	434	425
Glasgow	337	-15	533	+34	291	329	470	435	374	397	359	329	398
² Mean for the whole of Scotland }	421	-5	571	+29	430	408	522	461	474	415	437	397	443
IRELAND:													
Edenfel (Omagh)	429	+13	549	+45	393	430	467	420	404	463	373	370	378
Markree Castle	449	+8	541	+30	384	449	453	437	404	461	423	384	416
Armagh	309	-2	363	+15	317	321	364	325	318	351	312	305	315
Dublin	222	-20	316	+14	294	261	343	277	271	294	269	312	278
Parsonstown	329	...	408	+24	282	311	385	331	342	378	324	290	330
Kilkenny	315	-4	420	+28	331	303	392	309	291	414	292	337	328
² Mean for the whole of Ireland. }	389	-2	479	+21	372	377	449	406	386	445	380	368	397

¹ The Average Fall is in nearly all cases deduced from observations extending over the thirty-five years 1866-1900.

The Mean Rainfall for each country is based upon observations made at a large number of stations in addition to those given above.

392 *The Weather during the Agricultural Year, 1903-1904.*

[Continued from page 389.]

For the autumn as a whole the mean temperature was below the average, especially over the midland and southern counties. Rain was much less frequent than usual, and the actual amount far below the average, the only districts in which it reached even two-thirds of the normal being the south-western counties and the Channel Islands. In all other parts of the country the fall was considerably less than half that experienced in the autumn of 1903, and over our north-eastern and midland counties (where the aggregate was only half the average) the amount was only about one-third of that experienced in the previous year. Sunshine was more abundant than usual, especially over the northern parts of the country. In the north-western district (including North Wales) there was on an average nearly one hour per day more than the normal allowance.

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Wandsworth Common.

Royal Agricultural Society of England.

(Established May 9, 1838, as the ENGLISH AGRICULTURAL SOCIETY, and Incorporated by Royal Charter on March 26, 1840.)

Patron.

HIS MOST GRACIOUS MAJESTY THE KING.

President for 1904—1905.

LORD MIDDLETON.

Trustees.

Year when
elected on
Council

1895	H.R.H. THE PRINCE OF WALES, K.G., <i>Marlborough House, S.W.</i>
1895	BEDFORD, Duke of, K.G., <i>Woburn Abbey, Bedfordshire.</i>
1882	CAWDOR, Earl, <i>Stackpole Court, Pembrokeshire.</i>
1885	COVENTRY, Earl of, <i>Croome Court, Severn Stoke, Worcestershire.</i>
1895	DERBY, Earl of, K.G., <i>Knowsley, Prescott, Lancashire.</i>
1871	EGERTON OF TATTON, Earl, <i>Tatton Park, Knutsford, Cheshire.</i>
1881	GILBEY, Sir WALTER, Bart., <i>Elsenhall Hall, Stausted, Essex.</i>
1863	KINGSCOTE, Col. Sir NIGEL, G.C.V.O., K.C.B., <i>Kingscote, Wotton-under-Edge, Gloucestershire.</i>
1899	MIDDLETON, Lord, <i>Birdsall House, York.</i>
1880	MORETON, Lord, <i>Sarsden House, Chipping Norton, Oxon.</i>
1874	SPENCER, Earl, K.G., <i>Althorp, Northampton.</i>
1881	THOROLD, Sir JOHN H., Bart., <i>Syston Park, Grantham, Lincolnshire.</i>

Vice-Presidents.

1889	H.R.H. PRINCE CHRISTIAN, K.G., <i>Cumberland Lodge, Windsor.</i>
1862-66 }	ARKWRIGHT, J. HUNGERFORD, <i>Hampton Court, Leominster, Herefordshire.</i>
1877 }	
1898	CAVENDISH, VICTOR C. W., M.P., <i>Holker Hall, Lancashire.</i>
1872-74 }	CHAPLIN, Rt. Hon. HENRY, M.P., <i>Stafford House, St. James's, S.W.</i>
1884 }	
1887	CRUTCHLEY, PERCY, <i>Sunninghill Lodge, Ascot, Berkshire.</i>
1876	FEVERSHAM, Earl of, <i>Duncombe Park, Helmsley, Yorkshire.</i>
1883-90 }	JERSEY, Earl of, G.C.B., G.C.M.G., <i>Middleton Park, Bicester, Oxon.</i>
1894 }	
1865	LOPES, Rt. Hon. Sir MASSEY, Bart., <i>Maristow, Roborough, Devon.</i>
1881	PARKER, Hon. CECIL T., <i>Eccleston, Chester.</i>
1874	SANDAY, GEORGE H., <i>Highfield, Uxbridge, Middlesex.</i>
1869	WHITEHEAD, CHARLES, <i>Barming House, Maidstone, Kent.</i>
1865	WILSON, Sir JACOB, <i>Chillingham Barns, Belford, Northumberland.</i>

Year when
elected on
Council

Other Members of Council.

1880	ASHWORTH, ALFRED, <i>Horsley Hall, Gresford.</i>
1899	ASSHETON, R. C., <i>Hall Foot, Clitheroe, Lancashire.</i>
1871	BOWEN-JONES, J., <i>St. Mary's Court, Shrewsbury.</i>
1890	BROUGHAM AND VAUX, Lord, <i>Brougham Hall, Penrith.</i>
1893	CORNWALLIS, F. S. W., <i>Linton Park, Maidstone, Kent.</i>
1891	CURTIS-HAYWARD, Lieut.-Col. J. F., <i>Quedgeley, Gloucester.</i>
1888	DARBY, ALFRED E. W., <i>Little Ness, Shrewsbury.</i>
1891	DUGDALE, J. MARSHALL, <i>Llwyn, Llanfyllin, S.O., Mont.</i>
1903	FELLOWES, Hon. AILWYN E., M.P., <i>Haningham, Norwich.</i>
1879	FOSTER, S. P., <i>Killhow, Carlisle, Cumberland.</i>
1875	FRANKISH, WILLIAM, <i>The Moorlands, Bracebridge, Lincoln.</i>
1879	GORRINGE, HUGH, <i>Ashcroft, Kingston-by-Sea, Brighton, Sussex.</i>
1896	GRANBY, Marquis of, <i>Belvoir Castle (Grantham), Leicestershire.</i>
1900	GREAVES, R. M., <i>Wern, Portmadoc, North Wales.</i>
1904	GREENALL, Sir GILBERT, Bart., <i>Walton Hall, Warrington, Cheshire.</i>
1879	GRENVILLE, R. NEVILLE, <i>Butleigh Court, Glastonbury, Somerset.</i>
1903	HARRISON WILLIAM, <i>Hall House, Leigh, Lancashire.</i>
1903	HOBBS, ROBERT W., <i>Kelmseott, Lechlade, Glos.</i>
1888	HORNSBY, JAMES, <i>Laxton Park (Stamford), Northamptonshire.</i>
1900	HOWARD, JOHN HOWARD, <i>St. Mary's House, Bedford.</i>
1904	KNOWLES, R. MILLINGTON, <i>Colston Bassett Hall, near Bingham, Notts.</i>
1897	LEVETT, Captain W. S. B., <i>Milford Hall, Stafford.</i>
1897	MARSHALL, HENRY D., <i>Carr House, Gainsborough, Lincolnshire.</i>
1874	MARTIN, JOSEPH, <i>Highfield House, Littleport, Isle of Ely, Cambs.</i>
1904	MATHEWS, ERNEST, <i>Little Shardeloes, Amersham, Bucks.</i>
1904	MIDDLETON, CHRISTOPHER, <i>Vane Terrace, Darlington, Co. Durham.</i>
1884	MILLER, T. HORROCKS, <i>Singleton Park, Poulton-le-Fylde, Lancashire.</i>
1904	MONTEFIORE, Rev. D. B., <i>The World's End, Islip, Oxon.</i>
1886	MUNTZ, Sir P. ALBERT, Bart., M.P., <i>Dunsmore, Rugby, Warwickshire.</i>
1899	NORTHBROOK, Earl of, <i>Stratton, Micheldever, Hants.</i>
1904	PALMER, RALPH, <i>Hubbards, Nazeing, Waltham Cross, Essex.</i>
1886	PELL, ALBERT, <i>Hazelbeach, Northampton.</i>
1900	PROUT, W. A., <i>Sawbridgeworth, Herts.</i>
1897	REYNARD, FREDERICK, <i>Sunderlandwick, Driffield, Yorkshire.</i>
1897	ROGERS, C. COLTMAN, <i>Stanage Park, Brompton Bryan, Herefordshire.</i>
1894	RYLAND, HOWARD P., <i>Moxhull Park, Erdington, Birmingham.</i>
1901	SCOBY, WILLIAM, <i>Hobground House, Sinnington, Yorks.</i>
1903	SHACKLE, ERNEST W., <i>Redleaf, Hayes, Middlesex.</i>
1886	SMITH, ALFRED J., <i>Rendlesham, Woodbridge, Suffolk.</i>
1891	STANYFORTH, E. WILFRID, <i>Kirk Hammerton Hall, York.</i>
1875	STRATTON, RICHARD, <i>The Duffryn, Newport, Monmouthshire.</i>
1889	TAYLOR, GARRETT, <i>Trowse House, Norwich.</i>
1904	TURNER, ARTHUR P., <i>The Leen, Pembridge, Herefordshire.</i>
1882	WARREN, REGINALD AUGUSTUS, <i>Preston Place, near Worthing, Sussex.</i>
1902	WENLOCK, Lord, G.C.S.I., <i>Esrick Park, York.</i>
1889	WHEELER, E. VINCENT V., <i>Newnham Court, Tenbury, Worcestershire.</i>
1898	WILLIAMS, J. C., <i>Cuerhays Castle, St. Austell, Cornwall.</i>
1889	WILSON, C. W., <i>Rigmaden Park, Kirkby Lonsdale, Westmorland.</i>

[Two vacancies.]

STANDING COMMITTEES.

* * The PRESIDENT is a Member *ex officio* of all Committees, and the TRUSTEES and VICE-PRESIDENTS are Members *ex officio* of all Standing Committees except the Committee of Selection.

Finance Committee.

KINGSCOTE, Col. Sir NIGEL (Chairman).	CRUTCHLEY, PERCY.
THOROLD, Sir J. H., Bart.	FRANKISH, W.
ASHWORTH, A.	SANDAY, G. H.
CORNWALLIS, F. S. W.	WHEELER, E. V. V.

House Committee.

CHAIRMAN of Finance Committee.	WILSON, Sir JACOB.
THE PRESIDENT.	CRUTCHLEY, PERCY.
PARKER, Hon. C. T.	SANDAY, G. H.
GILBEY, Sir WALTER, Bart.	

Journal Committee.

THOROLD, Sir J. H., Bart. (Chairman).	ASHWORTH, A.	PELL, ALBERT.
DERBY, Earl of, K.G.	CORNWALLIS, F. S. W.	ROGERS, C. C.
JERSEY, Earl of, G.C.B.	FRANKISH, W.	WHITEHEAD, C.
	GRENVILLE, R. NEVILLE.	

Chemical and Woburn Committee.

BOWEN-JONES, J. (Chairman).	GREAVES, R. M.	PROUT, W. A.
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CAWDOR, Earl.	HOWARD, JOHN HOWARD.	RYLAND, H. P.
WENLOCK, Lord.	LEVETT, Capt. W. S. B.	STANYFORTH, E. W.
PARKER, Hon. C. T.	MIDDLETON, C.	TURNER, A. P.
THOROLD, Sir J. H., Bart.	PELL, ALBERT.	WARREN, R. A.

Botanical and Zoological Committee.

WHEELER, E. V. V. (Chairman).	CORNWALLIS, F. S. W.	PELL, ALBERT.
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THOROLD, Sir J. H., Bart.	GRENVILLE, R. NEVILLE.	REYNARD, F.
ASHWORTH, A.	HORNSBY, J.	ROGERS, C. C.
BOWEN-JONES, J.	MIDDLETON, C.	WHITEHEAD, C.
	MONTEFIORE, Rev. D. B.	

Veterinary Committee.

PARKER, Hon. C. T. (Chairman).	ASHWORTH, A.	MILLER, T. H.
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NORTHBROOK, Earl of.	COPE, A. C.	COLL. OF VET.
BROUGHAM AND VAUX, Lord.	CRUTCHLEY, PERCY.	SURGEONS.
MORETON, Lord.	CURTIS-HAYWARD, Lt.-Col.	REYNARD, F.
FELLOWES, Hon. A. E., M.P.	DARBY, ALFRED.	SMITH, A. J.
THOROLD, Sir J. H., Bart.	LEVETT, Capt. W. S. B.	STANYFORTH, E. W.
KINGSCOTE, Col. Sir NIGEL.	McFADYEAN, Prof.	SWITHINBANK, H.
WILSON, Sir JACOB.	MASTER OF FARRIERS' COMPANY.	WHEELER, E. V. V.
BROWN, Prof. Sir GEORGE.		WILSON, C. W.

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CRUTCHLEY, PERCY.	SMITH, A. J.	Stock.

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FRANKISH, W. (Chairman).	GREAVES, R. M.	REYNARD, F.
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CRUTCHLEY, PERCY.	MARSHALL, H. D.	plements.
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	MARTIN, JOSEPH.	The Steward of Forage.

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		WHEELER, E. V. V.

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Consulting Botanist.—W. CARRUTHERS, F.R.S., 44 Central Hill, Norwood, S.E.

Consulting Veterinary Surgeons.—Prof. Sir GEORGE T. BROWN, C.B., Harrow; Prof. J. MCFADYEAN, M.B., Royal Veterinary College, Camden Town, N.W.

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Superintendent of the Showyard.—ROBERT S. BURGESS, 13 Hanover Square, W.

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**GEOGRAPHICAL DISTRIBUTION OF MEMBERS OF THE COUNCIL
AND OF GOVERNORS AND MEMBERS OF THE SOCIETY.**

(December 8, 1904.)

DISTRICTS	COUNTIES	NUMBER OF GOVERNORS AND MEMBERS	NUMBER OF MEMBERS OF COUNCIL	NAMES OF MEMBERS OF COUNCIL
A.	BEDFORDSHIRE .	122	2	{ Duke of Bedford, K.G., T.; John Howard Howard.
	BUCKINGHAMSHIRE .	152	1	Ernest Mathews.
	CAMBRIDGESHIRE .	162	1	Joseph Martin.
	ESSEX . . .	239	2	{ Sir Walter Gilbey, T.; Ralph Palmer.
	HERTFORDSHIRE .	191	1	W. A. Prout.
	HUNTINGDONSHIRE .	69	...	
	LONDON . . .	691	2	{ H.R.H. The Prince of Wales, K.G., T.; Rt. Hon. Henry Chaplin, V.P.
	MIDDLESEX . . .	152	2	{ G. H. Sanday, V.P.; E. W. Shackle.
	NORFOLK . . .	245	2	{ Hon. A. E. Fellowes; Garrett Taylor.
	OXFORDSHIRE . .	123	4	{ Lord Moreton, T.; Earl of Jersey, V.P.; R. W. Hobbs; Rev. D. B. Montefiore.
	SUFFOLK . . .	218	1	A. J. Smith.
		— 2,364	— 18	
B.	CUMBERLAND . .	108	1	S. P. Foster.
	DURHAM . . .	111	1	C. Middleton.
	NORTHUMBERLAND .	198	1	Sir Jacob Wilson, V.P.
	WESTMORLAND . .	65	2	{ Lord Brougham and Vaux; C. W. Wilson.
		— 482	— 5	
C.	DERBYSHIRE . .	160	...	
	LEICESTERSHIRE .	156	1	Marquis of Granby.
	LINCOLNSHIRE . .	259	3	{ Sir J. H. Thorold, T.; W. Frankish; H. D. Marshall.
	NORTHAMPTONSHIRE	175	3	{ Earl Speneer, K.G., T.; J. Hornsby; A. Pell.
	NOTTINGHAMSHIRE .	156	1	R. Millington Knowles.
	RUTLAND . . .	34	...	
		— 940	— 8	

DISTRIBUTION OF MEMBERS OF THE SOCIETY—continued.

DISTRICTS	COUNTIES	NUMBER OF GOVERNORS AND MEMBERS	NUMBER OF MEMBERS OF COUNCIL	NAMES OF MEMBERS OF COUNCIL
D.	BERKSHIRE . . .	194	2	{ H.R.H. Prince Christian, K.G., v.p.; P. Crutchley, v.p.
	CORNWALL . . .	89	1	{ J. C. Williams.
	DEVONSHIRE . . .	127	1	{ Sir Massey Lopes, v.p.
	DORSETSHIRE . . .	66	...	
	HAMPSHIRE . . .	191	1	{ Earl of Northbrook.
	KENT . . .	446	2	{ C. Whitehead, v. p. ; F. S. W. Cornwallis.
	SOMERSETSHIRE . . .	100	1	{ R. Neville Grenville.
	SURREY . . .	228	...	
E.	SUSSEX . . .	330	2	{ H. Gorringe ; R. A. Warren.
	WILTSHIRE . . .	139	...	
		—1,910	— 10	
	YORKSHIRE . . .	— 558	— 6	{ Lord Middleton, P.; Earl of Feversham, v. p. ; Lord Wenlock; F. Reynard; W. Scooby ; E. W. Stanyforth.
	GLOUCESTERSHIRE . . .	284	2	{ Col. Sir Nigel Kingscote, T.; Lt.-Col. J. F. Curtis-Hayward.
	HEREFORDSHIRE . . .	122	3	{ J. H. Arkwright, v.p.; C. C. Rogers ; A. P. Turner.
	MONMOUTHSHIRE . . .	51	1	{ R. Stratton.
	SHROPSHIRE . . .	259	2	{ J. Bowen-Jones ; A. Darby.
F.	STAFFORDSHIRE . . .	265	1	{ Capt. W. S. B. Levett.
	WARWICKSHIRE . . .	204	2	{ Sir P. A. Muntz ; H. P. Ryland.
	WORCESTERSHIRE . . .	180	2	{ Earl of Coventry, T. ; E. V. V. Wheeler.
	SOUTH WALES . . .	198	1	{ Earl Cawdor, T.
		—1,563	— 14	
	CHESHIRE . . .	371	3	{ Earl Egerton of Tatton, T. ; Hon. Cecil T. Parker, v.p.; Sir Gilbert Greenall, Bt.
	LANCASHIRE . . .	377	5	{ Earl of Derby, K.G., T.; Victor C. W. Cavendish, v.p.; R. C. Assheton; W. Harrison ; T. H. Miller.
	NORTH WALES . . .	178	3	{ A. Ashworth; J. M. Dugdale; R. M. Greaves.
G.		— 926	— 11	
	SCOTLAND . . .	181		
	IRELAND . . .	138		
	CHANNEL ISLANDS . . .	13		
	ISLE OF MAN . . .	6		
	FOREIGN COUNTRIES . . .	178		
	HONORARY MEMBERS . . .	31		
		— 547		
GRAND TOTALS . . .		9,290	72	

GOVERNORS OF THE SOCIETY.

	Date of election as Member	Date of election as Governor
HIS MAJESTY THE KING...Windsor Castle	—	Feb. 3, 1864
T†H.R.H. THE PRINCE OF WALES, K.G....Marlborough House, S.W., and Sandringham, Norfolk	—	April 6, 1892
VP H.R.H. PRINCE CHRISTIAN OF SCHLESWIG-HOLSTEIN, K.G....Cumberland Lodge, Windsor	—	Aug. 4, 1875
†ACLAND, Alfred Dyke...Dancesbury, Welwyn	Oct. 8, 1902	Feb. 4, 1903
†ALLCROFT, Herbert John...Stokesay Court, Onibury, Salop.	—	Dec. 12, 1888
†AMHERST OF HACKNEY, Lord...Didlington Hall, Brandon	Feb. 2, 1859	May 7, 1890
†ANCASTER, Earl of...Normanton Park, Stamford	Mar. 3, 1869	May 5, 1875
ARCHER-HOUBLON, George B....Hallingbury Place, Bishop's Stortford	—	Mar. 6, 1889
VP†ARKWRIGHT, J. Hungerford...Hampton Court, Leominster	—	June 5, 1861
BARNARD, Lord...Raby Castle, Darlington	—	July 27, 1892
T†BEDFORD, Duke of, K.G....Woburn Abbey, Bedfordshire	—	May 3, 1893
†BEEVER, W. F. Holt...Yewden Lodge, Henley-on-Thames	April 2, 1879	June 6, 1894
†BELPER, Lord...Kingston, Derby	July 6, 1881	Mar. 6, 1895
†BENN, Thomas G...Thornton Gate, Rossall Beach, Fleetwood, R.S.O.	Mar. 13, 1878	Aug. 2, 1882
†BLYTH, Sir James, Bart....Blythwood, Stansted, Essex	Nov. 3, 1875	July 27, 1892
BRASSEY, Henry Leonard C....Preston Hall, Aylesford, Kent.	—	Feb. 3, 1892
†BUCHANAN, James...Lavington Park, Petworth	—	July 27, 1904
BURGHCLERE, Lord...48 Charles Street, Berkeley Square, W.	—	Dec. 7, 1892
BURTON, Lord...Rangemore, Burton-on-Trent	Nov. 7, 1888	June 25, 1890
CADOGAN, Earl, K.G....Culford Hall, Bury St. Edmunds	—	Dec. 11, 1889
CALTHORPE, Lord...Elvetham, Winchfield	Nov. 7, 1883	May 2, 1894
†CATHCART, Earl...Thornton-le-Street, Thirsk	Feb. 6, 1856	April 3, 1867
VP†CAVENDISH, Victor C. W., M.P....Holker Hall, Lancashire	—	Mar. 2, 1892
T†CAVDOR, Earl...Stackpole Court, Pembrokeshire	Mar. 3, 1863	Mar. 2, 1892
†CAWSTON, George...The Manor House, Cawston, Norfolk	—	June 6, 1894
VP CHAPLIN, Rt. Hon. Henry, M.P....Stafford House, S.W.	—	Nov. 2, 1870
CHELSEA, Viscount...48 Bryanston Square, W.	—	Feb. 6, 1895
†CLARENDON, Earl of, G.C.B....The Grove, Watford	June 5, 1872	May 2, 1894
†CLINTON, Lord...Heanton Satchville, Beaford, N. Devon	April 3, 1867	April 2, 1890
CORNWALLIS, Fiennes S.W....Linton Park, Maidstone	—	July 2, 1884
T†COVENTRY, Earl of...Croome Court, Severn Stoke, Wore.	April 1, 1863	April 4, 1894
†COWPER, Earl, K.G....Panshanger, Hertford	—	April 7, 1875
†COX, Frederick...Harefield Place, Uxbridge	—	July 31, 1901
CRAVEN, Thomas...Woodhey Park, Ashton-on-Mersey	May 6, 1891	Dec. 6, 1893
CREWE, Earl of...Crewe Hall, Crewe, Cheshire	Feb. 6, 1884	Mar. 7, 1894
VP CRUTCHLEY, Percy...Sunninghill Lodge, Ascot	June 3, 1879	Feb. 1, 1905
DARTMOUTH, Earl of...Patshull Hall, Wolverhampton	—	Dec. 9, 1891
T†DERBY, Earl of, K.G., G.C.B....Knowsley, Prescott	June 3, 1874	May 2, 1894
DERWENT, Lord...Hackness Hall, Scarborough	—	April 7, 1869
†DE TRAFFORD, Sir H. F., Bart....Hill Crest, Market Harborough	Aug. 1, 1883	June 1, 1892
†DEVONSHIRE, Duke of, K.G....Chatsworth, Chesterfield	—	June 2, 1880
†DEWHURST, G. Littleton...Beechwood, Lymm, Cheshire	Dec. 9, 1891	May 2, 1894

T Trustee. VP Vice-President. † Life Governor. || Member of Council

	Date of Election as Member	Date of Election as Governor
†DICKSON-POYNTER, Sir J., Bart., M.P....Hartham Park, Corsham, Wills	Nov. 2, 1887	April 2, 1890
DIGBY, Lord....Minterne House, Cerne Abbas, Dorset	—	July 25, 1894
†DULEEP-SINGH, Prince Frederick...Old Buckenham Hall, Attle- borough	—	July 25, 1894
DUNCOMBE, Capt. W. H. O....Waresley Park, Sandy, Beds.	April 1, 1885	May 6, 1896
†DUNMORE, Earl of...Carlton Club, Pall Mall, S.W.	—	Feb. 3, 1869
†DURHAM, Earl of...Lambton Castle, Durham	—	July 14, 1880
T EGERTON OF TATTON, Earl...Tatton Park, Knutsford	Mar. 6, 1872	Nov. 7, 1883
†ELLESMERE, Earl of...Worsley Hall, Manchester	—	July 7, 1869
ESSEX, Earl of...9 Mansfield Street, W.	Nov. 7, 1888	Nov. 2, 1892
EVANS, Lewis, F.S.A....Russells, Watford	—	July 27, 1904
EXETER, Marquis of...Burghley House, Stamford	May 4, 1898	June 21, 1898
VP FEVERSHAM, Earl of...Duncombe Park, Helmsley, Yorks.	Mar. 5, 1862	Mar. 3, 1875
FIFE, Duke of, K.T....15 Portman Square, W.	—	Nov. 7, 1888
*FLETCHER, John Philip...Darby Lodge, Sunbury-on-Thames	Feb. 19, 1840	Mar. 5, 1890
†FORTESCUE, Earl...Castle Hill, South Molton	—	Nov. 6, 1861
T GILBEY, Sir Walter, Bart....Elsenham Hall, Essex	Nov. 2, 1870	June 5, 1889
GLENESK, Lord...139 Piccadilly, W.	—	Dec. 12, 1888
GOLDSMID, Oliver E. d'Avigdor...Somerhill, near Tonbridge	—	Mar. 5, 1902
GRAFTON, Duke of, K.G....Wakefield Lodge, Stony Stratford	—	June 3, 1884
†GRANT, Sir G. Macpherson, Bart....Ballindalloch Castle, N.B.	April 1, 1863	April 2, 1890
†GREENALL, Sir Gilbert, Bart....Walton Hall, Warrington	Feb. 3, 1892	May 2, 1894
GRIFFITHS, John James...Highbury Grange, Highbury, N.	—	May 1, 1889
GROVES, James Grimble, M.P....Oldfield Hall, Altrincham, Cheshire	—	May 1, 1895
GWYNNE, John...Kenton Grange, The Hyde, Middlesex	—	Mar. 5, 1879
HAREWOOD, Earl of...Harewood House, Leeds	June 6, 1883	Nov. 2, 1892
HAY-DRUMMOND, Arthur W. H....Cromlix, Dunblane	—	Nov. 4, 1896
†HENDERSON, Sir Alex., Bart., M.P....Buscot Park, Faringdon, Berks	Nov. 5, 1890	July 28, 1897
†HENRYSON-CAIRD, James A....Cassencary, Creetown R.S.O., Kirk- cudbright	May 7, 1873	July 31, 1895
HERTFORD, Marquis of...Ragley Park, Alcester	Aug. 2, 1882	May 7, 1884
†HEYWOOD, Sir Arthur Percival, Bart....Duffield Bank, Derby	April 7, 1875	Feb. 2, 1898
†HOLFORD, Capt. George L., C.I.E....Westonbirt House, Tetbury, Glos.	—	April 6, 1892
†HORNSBY, James...Laxton Park, Stamford	June 6, 1878	May 29, 1895
†HOTHFIELD, Lord...Hothfield Place, Ashford, Kent	—	May 7, 1879
†HUTH, Louis...Possingworth, Cross-in-Hand, Hawkhurst	Dec. 12, 1888	Feb. 6, 1895
†IRWIN, Colonel Thomas A....Lynehew, Carlisle	May 5, 1880	June 23, 1895
†IVEAGH, Lord, K.P....5 Grosvenor Place, S.W.	—	June 6, 1894
VP†JERSEY, Earl of, G.C.B., G.C.M.G....Middleton Park, Bicester.	June 30, 1875	April 4, 1894
JOICEY, E....Blenkinsopp Hall, Haltwhistle, Northumberland	—	Dec. 12, 1888
†JONES, Walter J. H....Blakemere, Hartford, Cheshire	April 11, 1888	May 2, 1894
T†KINGSCOTE, Col. Sir Nigel, G.C.V.O., K.C.B....Kingscote, Wotton- under-Edge, Glos.	April 6, 1854	July 1, 1874

* Elected a Foundation Life Governor, March 5, 1890.

T Trustee.

VP Vice-President.

† Life Governor.

|| Member of Council.

	Date of Election as Member	Date of Election as Governor
†KLEINWORT, Herman Greverns...Wierton Place, Boughton Mon- chelsea, Kent	—	June 4, 1902
§KOLHAPUR, H.H. The Maharaja of, G.C.S.I....Kolhapur, India	—	Feb. 6, 1889
†KYNERSLEY, Thomas F....Leighton Hall, Ironbridge, Salop.	Nov. 7, 1883	Nov. 4, 1891
†LANSDOWNE, Marquis of, K.G., G.C.S.I....Bowood, Calne, Wilts.	Feb. 3, 1875	Feb. 5, 1896
LATHOM, Earl of...Lathom House, Ormskirk	—	Nov. 4, 1903
†LECONFIELD, Lord...Petworth House, Sussex	—	Mar. 6, 1901
†LEICESTER, Earl of, K.G....Holkham Hall, Norfolk	—	Nov. 15, 1843
†LEIGH, Lord...Stoneleigh Abbey, Kenilworth	—	Dec. 1, 1858
†LINLITHGOW, Marquis of, K.T., G.C.M.G., G.C.V.O....Hopetoun House, South Queensferry, N.B.	Nov. 7, 1888	July 31, 1895
†LLANGATTOCK, Lord...The Hendre, Monmouth	Mar. 1, 1871	May 2, 1894
†LONDONDERRY, Marquis of, K.G....Seaham Hall, Seaham Harbourn, co. Durham	—	June 3, 1885
†LONG, Rt. Hon. Walter H., M.P....Rood Ashton, Trowbridge, Wilts	Aug. 4, 1880	Dec. 11, 1895
†LONSDALE, Earl of...Lowther Castle, Penrith	—	July 4, 1883
VP†LOPES, Rt. Hon. Sir Massey, Bart....Maristow, Roborough, Devon	Mar. 15, 1848	May 7, 1884
P MIDDLETON, Lord...Birdsall House, York	—	Mar. 3, 1875
MIDWOOD, G. Norris...Brown Street, Salford	April 11, 1888	Mar. 5, 1902
MONTEFIORE, Rev. D. B....The World's End, Islip, Oxon	Feb. 6, 1901	Mar. 5, 1902
†MOORSOM-MITCHINSON-MAUDE, C. R....Harewood, Leeds	Dec. 2, 1857	July 26, 1893
T†MORETON, Lord...Sarsden House, Chipping Norton, Oxon.	—	Mar. 3, 1875
†MOREWOOD, C. R. Palmer...Alfreton Park, Derbyshire	April 7, 1875	Feb. 7, 1894
†MORRELL, Lt.-Col. G. H., M.P....Headington Hill Hall, Oxford	June 6, 1878	July 25, 1894
†MOUNT-EDGECUMBE, Earl of, G.C.V.O...Mount-Edgumbe, Plymouth	Nov. 6, 1861	Mar. 5, 1890
MUNCASTER, Lord...Muncaster Castle, Ravenglass, Cumberland	—	June 23, 1891
NEELD, Lt.-Col. Sir Audley D., Bart., C.B., M.V.O....Grittleton, Chip- penham	—	July 31, 1901
NORFOLK, Duke of, K.G....Arundel Castle, Sussex	—	July 29, 1891
†ONSLow, Earl of, G.C.M.G....Clandon Park, Guildford, Surrey	Nov. 3, 1880	May 27, 1903
†PALMER, Sir Walter, Bart., M.P....Frognaal, Sunninghill, Berks	—	Feb. 1, 1899
VP†PARKER, Hon. Cecil T....Eccleston, Chester	April 7, 1876	May 25, 1898
†PARR, Roger Charlton...Grappenhall Heyes, Warrington	May 7, 1902	July 30, 1902
†PLATT, Col. Henry, C.B....Gorddino, Llanfairfechan	Mar. 5, 1862	Feb. 3, 1897
†PLATT, James E....Howbury Hall, near Bedford	June 30, 1886	May 1, 1895
†PORTLAND, Duke of, K.G....Welbeck Abbey, Worksop.	—	June 2, 1880
†PORTMAN, Viscount...Bryanston, Blandford	Aug. 6, 1862	Mar. 5, 1890
PORTSMOUTH, Earl of...Hurstbourne Park, Whitechurch, Hants	—	Dec. 9, 1891
†POWIS, Earl of...Powis Castle, Welshpool	April 6, 1887	June 23, 1891
†QUILTER, Sir W. Cuthbert, Bart., M.P....Bawdsey Manor, Wood- bridge, Suffolk	Mar. 3, 1886	April 7, 1897
RADNOR, Earl of...Longford Castle, Salisbury	—	April 9, 1902
†RAMSDEN, Lt.-Col. W. J. F....Rogerthorpe Manor, Pontefract	May 2, 1883	June 25, 1895
†REDESDALE, Lord...Batsford Park, Moreton-in-Marsh, Glos.	—	Nov. 3, 1886
REISS, James E....36 Cadogan Square, S.W.	Feb. 7, 1883	May 2, 1894
RICHMOND AND GORDON, Duke of...Goodwood, Chichester.	—	April 13, 1904

P President.
T Trustee.

† Life Governor.
VP Vice-President.

§ Honorary Member.
|| Member of Council.

List of Governors.

	Date of election as Member	Date of election as Governor
†RIDLEY, Viscount...36 Portland Place, W.	—	June 5, 1901
RIPON, Marquis of, K.G....Studley Royal, Ripon.	—	July 3, 1861
ROLLE, Hon. Mark...Bicton, Budleigh Salterton, Devon	—	Nov. 7, 1894
†ROSEBURY, Earl of, K.G....38 Berkeley Square, W.	—	June 6, 1894
ROTHSCHILD, Lord...148 Piccadilly, W.	Nov. 7, 1888	June 4, 1890
ROTHSCHILD, Leopold de...Ascott, Wing, Leighton Buzzard	—	Mar. 1, 1893
RUTLAND, Duke of, K.G....Belvoir Castle, Leicestershire	Dec. 12, 1888	Dec. 9, 1891
SALOMONS, Leopold...Norbury Park, Dorking	—	May 6, 1896
VP†SANDAY, George H....Highfield, Uxbridge	Mar. 4, 1868	Dec. 10, 1902
†SCHRÖDER, Baron J. H. W....The Dell, Staines	Nov. 3, 1869	April 2, 1890
*SIMONDS, W. Barrow...Abbotts Barton, Winchester	June 19, 1839	Mar. 5, 1890
†SMITH, Hon. W. F. D., M.P....3 Grosvenor Place, S.W.	—	Dec. 9, 1891
T SPENCER, Earl, K.G....Althorp Park, Northampton	Dec. 5, 1860	Mar. 3, 1875
†STANYPFORTH, E. Wilfrid...Kirk Hammerton Hall, York	Feb. 6, 1884	July 31, 1895
STUBS, Peter...Blaisdon Hall, Newnham, Glos.	July 27, 1892	Dec. 12, 1894
SUTHERLAND, Duke of, K.G....Stafford House, St. James's, S.W.	Mar. 1, 1882	Dec. 7, 1892
†SUTTON, Martin J....Henley Park, Oxfordshire	May 1, 1878	Feb. 1, 1882
†SWINBURNE, Sir John, Bart....Capheaton, Newcastle-on-Tyne	May 1, 1867	May 7, 1890
†TARLETON, Lieut. Alfred H., M.V.O., R.N....Breakspears, Uxbridge.	—	July 29, 1903
TATHAM, Ralph Heathcote...Starborough Castle, Edenbridge, Kent.	—	May 27, 1903
†THOMPSON, Henry Yates...19 Portman Square, W.	—	Nov. 7, 1894
T†THOROLD, Sir John H., Bart....Syston Park, Grantham	Aug. 5, 1868	May 1, 1889
TREDEGAR, Lord...Tredegar Park, Newport, Mon.	—	May 3, 1876
†TRENCH, Col. The Hon. Wm. Le Poer...3 Hyde Park Gardens, W.	Dec. 12, 1888	May 1, 1901
TURBERVILL, Col. J. P....Ewenny Priory, Bridgend	Mar. 5, 1884	July 27, 1892
†TWEEDMOUTH, Lord...Guisachan, Beaulieu, N.B.	—	July 31, 1889
WALTER, Col. Arthur F....Bearwood, Wokingham	—	Mar. 6, 1895
††WARREN, Reginald A....Preston Place, near Worthing	June 3, 1857	June 6, 1894
WATSON, Rev. Wentworth...Rockingham Castle, Uppingham	—	May 4, 1904
WATSON, William Clarence...Colworth, Bedford.	—	Dec. 11, 1895
WERNHER, Julius...82 Piccadilly, W.	—	April 13, 1904
WESTMINSTER, Duke of...Eaton Hall, Chester	—	May 30, 1900
VP†WHITEHEAD, Charles...Barming House, Maidstone	April 1, 1857	Feb. 6, 1889
†WILLIAMS, Henry...Moor Park, Harrogate	Aug. 1, 1883	Mar. 6, 1895
VP†WILSON, Sir Jacob...Chillingham Barns, Belford, Northumberland.	Dec. 5, 1860	Dec. 7, 1892
†WINDSOR, Lord...Hewel Grange, Bromsgrove	—	Nov. 6, 1878
WYNN, Hon. F. G....Glynllifon, Carnarvon	Mar. 4, 1891	Nov. 4, 1903
WYTHES, Ernest J....Copped Hall, Epping, Essex	April 12, 1893	July 29, 1903
†YERBURGH, Robert A., M.P....Woodfold Park, Blackburn	—	Nov. 7, 1888
†ZETLAND, Marquis of, K.T....Aske Hall, Richmond, Yorks.	Feb. 4, 1874	May 2, 1894

* Elected a Foundation Life Governor, March 5, 1890.

† Life Governor.

T Trustee.

VP Vice-President.

‡ Member of Council.

HONORARY MEMBERS OF THE SOCIETY.

("British Subjects or Foreigners who have rendered exceptional services to Agriculture or Allied Sciences," and who have been elected under Bye-law 8 as Honorary Members, without payment of subscription.)

	Date of election
ARNIM, Berndt von...Criewen, Brandenburg, Germany	June 21, 1899
BANG, Dr. B....Professor at the Royal Veterinary College, Copenhagen.	July 31, 1901
BROWN, Professor Sir George T., C.B....Bryn Hyfryd, Harrow (Ordinary Member, Dec. 3, 1862)	April 1, 1878
CARTUYVELS-VAN-DER-LINDEN, Jules, M.A....215 Rue de la Loi, Brussels	Dec. 11, 1895
CHAUVEAU, Prof. Auguste, M.D., LL.D....10 Avenue Jules Janin, Passy, Paris.	Dec. 6, 1893
COPE, Alexander C....6 Cheniston Gardens, W. (Ordinary Member, Dec. 6, 1893)	May 1, 1901
DANNFELT, Carl Juhlin B....Villa Dannfelt, near Djursholm, Stockholm, Sweden	Feb. 1, 1871
DE VOGÜE, Marquis...2 Rue Fabert, Paris (Ordinary Member, June 1, 1892)	June 21, 1899
ELLIOTT, Sir Thomas H., K.C.B....Secretary, Board of Agriculture, 4 Whitehall Place	June 23, 1903
ETZDORF, Landrath von...Elbing, West Prussia	May 30, 1900
EWART, Prof. James Cossar, M.D., F.R.S....Regius Professor of Natural History at the University of Edinburgh	May, 1, 1901
FLEISCHMANN, Prof. Wm....Director of the Agricultural Institute of the Royal University of Königsberg	Dec. 12, 1894
FOSTER, Prof. Sir Michael, K.C.B., M.P., F.R.S....Nine Wells, Gt. Shelford, Cambridge	Feb. 3, 1897
KOLHAPUR, H.H. The Maharaja of, G.C.S.I. ...Kolhapur (Governor, Feb. 6, 1889)	July 7, 1902
LE COCQ, Señor Alfredo Carlos...Director of the Department of Agriculture, Lisbon	June 23, 1903
LIVEING, Prof. G. D., M.A., F.R.S....The University, Cambridge	Mar. 7, 1894
LOVINK, Herr Hermanus Johannis...Director-General of Agriculture, The Hague, Holland	April 13, 1904
MACDONALD, James, F.R.S.E....Secretary of the Highland and Agricultural Society of Scotland, 3 George IV. Bridge, Edinburgh	June 23, 1903
McFADYEAN, Prof. John, M.B., B.Sc., C.M....Royal Veterinary College, Camden Town, N.W. (Ordinary Member, Feb. 1, 1893)	May 1, 1901
NOBBE, Dr. J. C. F....Director of the Experimental Station, Tharand, Saxony	May 6, 1896
PASSY, Louis...45 Rue de Clichy, Paris	June 23, 1891
PLUNKETT, The Rt. Hon. Sir Horace Curzon, K.C.V.O., F.R.S....Vice-President of the Irish Department of Agriculture and Technical Instruction, Dublin	June 23, 1903
PROSKOWETZ, Emanuel Ritter von, Senr....Kwassitz, Moravia	Nov. 5, 1890
RAMOS-MEXIA, Señor Don Ezequiel...Sociedad Rural Argentina, Buenos Aires	July 30, 1902
SALMON, Dr. D. E....Chief of the Bureau of Animal Industry, United States Department of Agriculture, Washington	July 31, 1901
SANDERSON, Sir J. Burdon, Bart., F.R.S....Oxford	April 1, 1878
SCHERBATOFF, Prince Alexander...President of the Imperial Agricultural Society of Moscow, Russia	Nov. 3, 1897
SIEMONI, Dr. Giovanni Carlo...Director-General of the Department of Agriculture, Rome	June 23, 1903
THIEL, Dr. H....Privy Councillor, and Director of the Department of Agriculture, 17 Lutherstrasse, Berlin	Aug. 1, 1883
TISSERAND, Eugène...Ancien Directeur de l'Agriculture, 17 Rue du Cirque, Paris	Aug. 1, 1883
VASSILLIERE, Léon...Director of Agriculture at the Ministry of Agriculture, Paris	June 23, 1903

SUMMARY OF MEMBERS ON REGISTER, DECEMBER 8, 1904.

- 2 Foundation Life Governors (Members elected before the granting of the Charter on March 26, 1840).
 - 69 Governors paying an annual subscription of 5*l*.
 - 91 Life Governors who have compounded for their annual subscriptions.
 - 5,771 Members paying an annual subscription of 1*l*.
 - 3,216 Life Members who have compounded for their annual subscriptions.
 - 110 Life Members by Examination.
 - 31 Honorary Members.
- 9,290, Total number of Governors and Members at December 8, 1904.

Dr.

BALANCE-SHEET,

	£	s.	d.	£	s.	d.	£	s.	d.
To SUNDRY CREDITORS—									
Sundry Creditors and outstandings . . .				4,970	14	1			
Subscriptions received in 1903 in advance . .				108	0	0			
							5,078	14	1
To LOANS							14,500	0	0
To AVAILABLE CAPITAL—									
Capital at December 31, 1902				9,889	15	2			
Add Profit on realisation of Consols over value in Society's books (90 per cent.) at Dec. 13, 1902 .				159	5	6			
							10,049	0	8
Less Deficiency on Ordinary Income and Expenditure Account, as per Statement A .	45	10	10						
Deficiency on Show Income and Expenditure Account, as per Statement printed on pp. clxviii-clxxi of Vol. 64 of Society's Journal				9,680	13	8			
							9,726	4	6
							322	16	2
Reserve Fund at December 31, 1902	15,582	6	4						
Add Income on Investments	500	2	8						
Life Compositions received in 1903	629	0	0						
				16,711	9	0			
Less Contribution to Revenue (at 15s.) from 3,582 Life Governors and Members on books on January 1, 1903, + 42 Compounders during 1903	2,718	0	0				13,993	9	0
							14,316	5	2
DEPRECIATION written off, viz:—									
Fixtures	179	2	6						
Furniture	119	2	4						
Machinery	40	11	8						
Show Plant	1,786	11	3						
Buildings at Woburn	50	0	0				2,175	7	9
							12,140	17	5
To SUBSCRIPTIONS AND DONATIONS TO PERMANENT SITE FUND							27,557	7	0

[*Note.*—In addition to the Invested Assets, as stated in this Balance-sheet, the Society holds in its corporate name 8,126l. 8s. 2d. Consols, representing a Legacy of 9,000l. received in 1896 under the will of the late Mr. E. H. Hills. The income arising therefrom is, under the will, to be applied in the investigation of the value and uses of the rarer forms of ash in the cultivation of crops; and the Trust will be administered under the Charitable Trusts Acts.]

£59,276 18 6

SOCIETY OF ENGLAND.

xiii

DECEMBER 31, 1903.

Cr.

	£ s. d.	£ s. d.	£ s. d.
By 13,100 <i>l.</i> HAREWOOD HOUSE DEBENTURE STOCK at cost			13,144 17 4
By FIXTURES AT HAREWOOD HOUSE—			
Value at December 31, 1902	2,388 7 5		
Less Depreciation at 7½ per cent.	<u>179 2 6</u>		2,209 4 11
By FURNITURE—			
Value at December 31, 1902	2,622 6 0		
Less Depreciation at 7½ and 5 per cent.	<u>119 2 4</u>		2,503 3 8
By PICTURES (500 <i>l.</i>) and BOOKS (1,000 <i>l.</i>)			1,500 0 0
By MACHINERY—			
Value at December 31, 1902	405 16 10		
Less Depreciation at 10 per cent.	<u>40 11 8</u>		365 5 2
By SHOW PLANT—			
Value at December 31, 1902	4,106 19 2		
Less Depreciation as per new valuation	1,786 11 3		
Old Plant sold	<u>177 11 7</u>		
	1,964 2 10		
	2,142 16 4		
Additions during 1903	<u>539 2 0</u>		2,681 18 4
By COST OF ERECTION OF BUILDINGS FOR POT EXPERIMENTS AT WOBURN—			
As per Account at December 31, 1902	850 0 0		
Less Depreciation	<u>50 0 0</u>		800 0 0
By SUNDRY DEBTORS			2,961 16 5
By SHOW OF 1904—			
Timber at Park Royal	4,640 4 8		
Expenditure on account	<u>793 2 0</u>		5,433 6 8
By CASH AT BANKERS AND IN HAND—			
At Bankers	60 14 1		
In Hand	<u>59 4 11</u>		119 19 0
By SHARES IN PARK ROYAL LIMITED.			
15,000 Shares of 1 <i>l.</i> each, at cost			27,557 7 0
			<u>£59,276 18 6</u>

Examined, audited, and found correct, this 25th day of April, 1904.

HUBERT J. GREENWOOD }
 JONAS M. WEBB } *Auditors on behalf of the Society.*
 NEWELL P. SQUAREY }

(A) STATEMENT OF ORDINARY INCOME

Corresponding figures for 1902

Income.

£

£ s. d. £ s. d.

ANNUAL SUBSCRIPTIONS:—

326	Governors : Subscriptions for 1903	306 0 0
81	Members : Received in 1902, but belonging to 1903 . .	97 0 0
5,658	Subscriptions for 1903	5,794 0 0
64	Subscriptions for previous years	89 0 0
5	Miscellaneous : Excess subscriptions, &c.	5 7 0
6,134		6,291 7 0

LIFE COMPOSITIONS:—

2,809 {	Contribution to Revenue (see Balance-sheet)—3,624 Life	
	Governors and Members at 15s. each . . .	2,718 0 0

8,943
339

Debit Balance carried to Balance-sheet . . .

$$\begin{array}{r} 9,009 \quad 7 \quad 0 \\ 45 \quad 10 \quad 10 \end{array}$$

69,282

ERNEST CLARKE, *Secretary.*

£9,054 17 10

WELTON, JONES & CO., *Accountants.*

AND EXPENDITURE FOR THE YEAR 1903.

xv

Corresponding figures for 1902

Expenditure.

		£	s.	d.	£	s.	d.
£	GENERAL ADMINISTRATION:—						
2,423	Proportion of Salaries of Official Staff	2,483	14	10			
340	Pensions to Officials	340	0	0			
59	Professional Charges	57	15	0			
1,970	House Rent, Taxes, Insurance, and House Expenses	1,966	10	9			
31	Binding and Purchase of Books	30	1	1			
352	Printing and Stationery	457	1	5			
106	Postage and Telegrams	107	5	4			
6	Carriage of Parcels, and Cabs	25	7	3			
70	Advertising and Miscellaneous Office Expenses	19	4	0			
58	Interest on Loan	261	16	11			
161							
5,576					5,748	16	7
	JOURNAL OF SOCIETY AND OTHER PUBLICATIONS:—						
815	Printers' Bills for the Journal for 1903 (Vol. 64)	713	14	2			
197	Engravings and Illustrations	157	11	7			
515	Assistant Editor and Literary Contributions	518	13	0			
248	Postage, Packing, and Delivery	259	6	8			
46	Miscellaneous Journal Printing	57	6	8			
6	Miscellaneous Journal Expenses	11	5	0			
78	Cost of Printing Pamphlets, &c.	22	5	1			
147							
23	Binding Text Book, "Elements of Agriculture"	21	0	0			
2,075					1,761	2	2
	Less: Received from Sales of Journals (Vol. 63 and earlier)	114	2	5			
109	Sales of Pamphlets and Diagrams	66	16	6			
67	Sales of Text Book on Agriculture	100	18	5			
122	Received for Advertisements in Vol. 64	133	12	10			
298					415	10	2
1,777							1,345 12 0
	LABORATORY:—						
1,100	Salaries, Wages, &c.	1,100	0	0			
72	Printing, and Sundry Expenses	51	6	9			
1,172		1,151	6	9			
462	Less: Fees received from Members for Analyses	387	5	0			
710							764 1 9
	OTHER SCIENTIFIC DEPARTMENTS:—						
263	Consulting Botanist's Salary and Expenses	263	7	10			
200	Zoologist's Salary and Expenses	211	0	0			
500	Grant to Royal Veterinary College	500	0	0			
4	Medals for Proficiency in Cattle Pathology	2	4	6			
11							976 12 4
978	EXAMINATION FOR NATIONAL DIPLOMA IN AGRICULTURE:—						
	Honoraria and Expenses of Examiners	168	10	5			
	Travelling Expenses of Officials	66	9	10			
	Hotel Expenses of Examiners and Officials	30	10	10			
	Printing, Stationery, and Advertising	24	3	5			
	Writing Diplomas and Gold Medal	12	3	6			
		301	18	0			
121	Less: Deposits forfeited, and Sales of Examination Papers &c.	63	4	0			
		238	14	0			
	Less: Moiety received from Highland and Agricultural Society	119	7	0			
					119	7	0
	EXAMINATION FOR NATIONAL DIPLOMA IN DAIRYING:—						
65	Hire of Premises and Appliances for Examination	50	15	0			
45	Fees to Examiners	30	9	0			
16	Hotel and Travelling Expenses	21	7	7			
9	Printing and Postage	3	12	3			
		106	3	10			
135	Less: Deposits forfeited, and Sales of Examination Papers	5	15	8			
15					100	8	2
120							
£9,282	Total Expenditure				£9,034	17	10

Examined, audited, and found correct, this 25th day of April, 1904.

HUBERT J. GREENWOOD }
JONAS M. WEBB } *Auditors on behalf of the Society.*
NEWELL P. SQUAREY }

[*Copy of a letter from the Society's Accountants.*]

5 MOORGATE STREET,
LONDON, E.C.,

April 22, 1904.

DEAR SIR,

It was stated in the Council's Report to the General Meeting of May 22, 1903 [see Journal, Vol. 64, page 243], that it was recognised that some changes in the system of accounts would be necessary for 1903 and subsequent years, and we were invited to attend a meeting of the Finance Committee held on the 18th instant to consider the form of Balance-sheet to be presented to the forthcoming General Meeting.

We then submitted a draft Balance-sheet the form of which was approved by the Finance Committee: and for your information and for that of the Auditors, who will presently be asked to examine the accounts, we beg to offer the following remarks.

As compared with those of former years, the Balance-sheet we now submit is more nearly in accord with the form usually adopted by commercial undertakings, and it shows on the one side the assets appearing in the books of the Society, and on the other—

(a) The liabilities which have to be discharged out of the assets above mentioned.

(b) The surplus resources of the Society, on the assumption that the assets are worth the full amount of the book figures.

It will be observed that we have stated the available capital at 12,140*l.* 17*s.* 5*d.*, and that in this has been merged the whole of the Reserve which in former years has been shown separately and has been regarded as a fund set aside for the purpose of providing the Life Members with the privileges which the Society, by its acceptance of their Life Compositions, has contracted to give them.

Before providing for the depreciation of plant, fixtures, &c., amounting to 2,175*l.* 7*s.* 9*d.*, it will be seen that the Society had only 322*l.* 16*s.* 2*d.* of capital left, so that it is clear that the Reserve, even if upheld as a separate fund, is already diminished.

It is true that, in thus describing the position, we are leaving out of account the asset represented by shares in Park Royal Limited, but as they were acquired by means of funds specially raised, we have preferred to show the special fund on one side of the Balance-sheet, and these shares on the other, in such a way as not to affect the figure of the Society's available capital.

So long as the Society had surplus funds over and above the amount set aside as Reserve, it seemed desirable that the latter should only be diminished by such annual contributions to Revenue, as would leave sufficient in the fund to provide the estimated cost of the privileges to be afforded to surviving Life Members; but the privileges of Life Members must yield to the claims of the Society's creditors.

It seems to follow from this that a contribution to Revenue from Life Members at 1*s.* per Member is, for the year 1903, inadequate; but we have not thought it right to make any alteration until the Auditors have had an opportunity of considering the matter in accordance with the request made to them by the Secretary as directed by resolution of the Council dated December 9, 1903.

At the same time, we desire to point out that the whole question of the gradual extinction of the Society's surplus by the deduction of these contributions requires early consideration, for it seems obvious that this depletion of the funds must restrict the sphere of the Society's operations generally.

We are, DEAR SIR,

Yours faithfully,

(Signed) WELTON, JONES & Co

SIR ERNEST CLARKE,

Secretary,

Royal Agricultural Society of England.

[*The Balance-sheet for 1903, in the form above suggested, was submitted to the Auditors on April 25, 1904, and approved (see pp. xii and xiii).*]

SPECIAL REPORT OF THE AUDITORS ON LIFE COMPOSITIONS.

At a Meeting of the Council of the Royal Agricultural Society held on December 9, 1903, the following resolution, moved by Sir WALTER GILBEY, and seconded by Sir NIGEL KINGSCOTE, was passed unanimously :—

“That, in view of the fact announced by the Site Committee in their Report presented to the Council on November 4, that the Society's Reserve Fund has practically disappeared in meeting the losses of this year's (1903) Show, the three Auditors appointed by the Members to examine the Society's Accounts for 1903, be requested to prepare a Special Report in continuation of the three previous Reports presented by their predecessors on March 2, 1891, March 20, 1895, and March 19, 1900, stating the number of Life Members elected in different years who are upon the Society's books as at December 31, 1903, and advising the Council as to the method in which provision should be made in the future for the continuance of the Life Members' privileges.”

In connection with our annual examination of the Society's accounts for the year 1903, we have carefully considered the above reference to us, so far as we have felt it to be within the scope of our duties as Auditors to the Society to go; and we have agreed upon the following Report:—

1. It may be desirable in the first place to give some explanation as to the original establishment of the “Reserve Fund” under the advice given by our predecessors as Auditors in their Report dated March 2, 1891, printed on pp. xii and xiii of Volume 52 of the Society's Journal (1891). Prior to 1890, all receipts in the form of Life Compositions were credited to the income of the year in which they happened to be paid. The discussions in the Council in 1889 and 1890 on the inadequacy of the Life Composition of 10*l.* then in force led to our predecessors being invited to consider “the manner in which the Life Compositions received in future are to be treated in the Society's Accounts, and also the contributions to the revenue of each future year which should be made in respect of the Life Compositions received in the past.”

2. On January 1, 1890, the Society held 30,000*l.* Consols., which had cost 29,033*l.* 9*s.* 4*d.* It was recommended that this 29,033*l.* 9*s.* 4*d.* should be regarded as the “Reserve Fund,” that to it should be added each year all Life Compositions received during that year (with, of course, the interest on the investments represented by the Reserve Fund), and from it should be subtracted each year an amount which would represent the cost of providing the Life Members then on the books with their privileges.

3. These annual additions and subtractions have been regularly made, and the actual figures have been recorded in the successive annual Balance-sheets. It was, of course, recognised from the first that the amount of this Reserve Fund, and hence the invested capital which might be regarded as ear-marked for it, would decrease as years went on, in view of the fact that the contribution to the revenue from the Life Members of the past would be greater than the amounts received for new Compositions and for interest on investments; but, per contra, the Society's obligations to its Life Members would be running off each year.

4. As shown in the Balance-sheet for 1903, the "Reserve Fund" stood on December 31 last at 13,993*l.* 9*s.*, with, of course, vastly diminished claims upon it, as against the 29,033*l.* 9*s.* 4*d.* with which it was started in 1890, fourteen years ago. But the invested capital now held against it, viz., the Society's holding of 13,100*l.* Harewood House Stock, is no longer available for the purpose of Life Members' future contributions to revenue, or indeed for the purposes of the Society at all, as it is pledged to the Bankers against advances for carrying on the Society's ordinary business ; which advances will have sooner or later to be liquidated.

5. We have, therefore, concurred in the recommendation made by the Society's professional Accountants for merging the whole of the Reserve Fund in the item of 12,140*l.* 17*s.* 5*d.* available capital at December 31, 1903 ; and in these circumstances it hardly appears to us that any useful object would be served by our proffering to the Council advice as to any method in which provision can be made in the future for the continuance of the Life Members' privileges, unless it be from some new fund to replace that which has disappeared through the exigencies of the Society's financial position.

6. At the same time, we feel bound to record our conviction that the time has arrived when the Society ought no longer to accept Life Compositions from its Members, at any rate upon the existing conditions ; as it is clear that for a long time to come the Society must be handicapped by having over a third of its Members (3,529 out of 9,562 at the end of 1903) who will pay nothing towards its support in future years, but who must be accorded the same privileges as the Annual Members who will be paying 1*l.* in each year.

7. Independently, therefore, of the necessity of making provision by way of Reserve to meet the possible losses on the next few Shows at Park Royal, there is the serious question to be faced of the possibility of providing in the future some 3,500 Life Members with their privileges out of the annual income to which only the 6,000 Members who subscribe 1*l.* a year will contribute : but this is a matter which we feel we must leave in the hands of the Council.

8. We append, as desired, a Statement of the total number of Life Members on the books on January 1, 1904, showing the years in which they were elected, and divided into two sections : (1) those who were elected before 1890 (when the Life Composition was at the rate of 10*l.*), and (2) those elected in 1890 and since, who have paid a Composition of 15*l.* [These Tables have been brought up to November 1, 1904, by the insertion of the existing figures.]

(Signed) { HUBERT J. GREENWOOD.
JONAS M. WEBB.
NEWELL P. SQUAREY.

13 Hanover Square, W.
April 27, 1904.

Auditors on behalf of the Society.

TABLE I.—*Compounders elected before 1890.*

Year of Election	No. on Books on Jan. 1				Nov. 1, 1904	Year of Election	No. on Books on Jan. 1				Nov. 1, 1904
	1890	1895	1900	1904			1890	1895	1900	1904	
1838—40	35	24	15	7	6	1866	26	21	21	18	18
1841	15	10	4	0	0	1867	30	26	25	20	19
1842	21	10	7	4	3	1868	46	48	45	39	39
1843	10	5	8	5	5	1869	96	90	74	65	61
1844	7	5	3	0	0	1870	82	79	62	55	54
1845	22	12	7	4	4	1871	81	72	76	71	69
1846	19	13	7	4	4	1872	87	89	73	57	55
1847	12	5	4	3	3	1873	102	98	87	77	73
1848	14	10	8	5	5	1874	86	79	75	66	66
1849	17	12	7	3	3	1875	148	130	126	105	103
1850	17	12	10	4	4	1876	92	88	87	74	72
1851	23	14	6	4	3	1877	93	88	88	80	79
1852	13	11	6	4	4	1878	112	106	103	93	91
1853	27	20	12	8	7	1879	162	250	223	214	207
1854	29	20	15	10	10	1880	127	119	107	102	96
1855	21	13	13	11	10	1881	96	94	83	86	81
1856	43	32	24	17	15	1882	144	133	121	116	114
1857	29	24	19	14	13	1883	210	194	180	165	162
1858	29	21	20	17	17	1884	217	212	198	185	185
1859	30	24	19	17	16	1885	136	126	111	100	99
1860	19	16	14	11	11	1886	101	97	89	81	80
1861	41	37	33	25	26	1887	90	94	97	92	90
1862	92	71	65	53	46	1888	114	119	115	93	84
1863	71	61	57	47	44	1889	506	516	493	479	476
1864	52	48	39	27	27	Total No. on Books	3825	3528	3207	2860	2781
1865	33	30	26	23	22						

TABLE II.—*Compounders elected in and since 1890.*

YEAR	No. on Books on Jan. 1				Nov. 1, 1904	YEAR	No. on Books on Jan. 1				Nov. 1, 1904
	1890	1895	1900	1904			1890	1895	1900	1904	
1890	—	81	75	72	73	1898	—	—	50	49	49
1891	—	72	66	58	59	1899	—	—	45	45	45
1892	—	76	73	68	66	1900	—	—	—	21	21
1893	—	64	65	63	62	1901	—	—	—	26	26
1894	—	59	59	56	55	1902	—	—	—	31	31
1895	—	—	43	40	38	1903	—	—	—	37	37
1896	—	—	51	51	50	1904	—	—	—	—	15
1897	—	—	55	52	51	Total No. of 15l. Compounders on Books	—	352	582	669	678

TOTAL OF LIFE MEMBERS ON BOOKS.

1890	3825	1900	3789	1904 (Nov. 1)	3459
1895	3880	1904 (Jan. 1)	3529		

NOTE.—Summarised, these Tables show that there are still (November 1, 1904) surviving 2,781 Members who paid the old Composition of 10*l.* and there are 678 Compounders who have paid 15*l.* These 3,459 Members have already been on the books for an aggregate period of 78,900 years, or an average of 22½ years each. The experience of the last 20 years shows that the average period during which a Life Member exercises his privileges is 27¼ years. It follows, therefore, that each of these 3,459 Life Members may be expected to remain on the books an average of 4½ years longer, though, of course, some will continue to be Members for a much more extended period than this. At the old rate of an annual contribution per head of 15*s.* to the Revenue, this would represent a capital sum of 11,674*l.*; which, under more favourable circumstances, might have been expected to be defrayed by the Reserve Fund, but must now be dealt with in some other way.

H. J. G.; J. M. W.; N. P. S. November 15, 1904.

STATEMENT OF RECEIPTS AND EXPEN-

JUNE 21 TO

Corresponding figures for 1903.

Receipts.

£		£ s. d.	£ s. d.
6,465	FEES FOR ENTRY OF IMPLEMENTS:—		
199	Implement Exhibitors' Payments for Shedding	4,893 4 6	
112	Non-Members' Fees for Entry of Implements	151 0 0	
	Fees for Entry of "New Implements"	70 0 0	
6,776			5,114 4 6
	FEES FOR ENTRY OF LIVE STOCK:—		
1,738	By Members:—1,664 Entries @ 1l.	1,664 0 0	
148	77 Post Entries @ 30s.	115 10 0	
84	43 Late Entries @ 2l.	86 0 0	
15	61 Substituted @ 5s.	15 5 0	
2,005			1,880 15 0
408	By Non-Members:—203 Entries @ 2l.	406 0 0	
20	25 Post Entries @ 50s.	62 10 0	
24	22 Late Entries @ 3l.	66 0 0	
3			
6	4 Substituted at 10s.	2 0 0	
461			536 10 0
693	Fees for Horse Boxes and Stalls		696 10 0
	FEES FOR ENTRY OF POULTRY:—		
23	By Members:—120 Entries @ 2s. 6d.	15 0 0	
1	17 Post Entries @ 5s.	4 5 0	
140	By Non-Members:—442 Entries @ 5s.	110 10 0	
7	24 Post Entries @ 10s.	12 0 0	
171			141 15 0
	OTHER ENTRY FEES:—		
87	Fees for Entry of Produce	62 15 0	
22	Fees for Entries in Horse-shoeing Competitions	25 0 0	
12	Fees for Entries in Draught Horses, Four-in-hand Competition, &c.	18 15 0	
121			106 10 0
	CATALOGUE:—		
10	Extra Lines for Particulars of Implement Exhibits	6 7 0	
9	Woodcuts of "New Implements"	7 17 6	
207	Advertising in Catalogue	137 8 5	
25	Sales of Implement Section of Catalogue (including bound copies)	23 5 3	
666	Sales of Combined Catalogue	495 19 9	
44	Sales of Programmes of Jumping Competitions, Awards, Programmes, &c.	22 17 5	
961		693 15 4	
45	Less Commission on Sales of Catalogues and Programmes	32 0 0	
916			661 15 4
	MISCELLANEOUS RECEIPTS:—		
86	Amount received from Refreshment Contractors	40 9 5	
50	Premium for Cloak Room, &c.	40 0 0	
2	Fees for Competitions forfeited.	4 0 0	
10			
24	Private Luncheon Tables	4 0 0	
1/4	Takings at Grooms' Cloak Room	0 1 4	
8	Takings at Carriage Enclosure	14 7 6	
1	Miscellaneous.	0 2 6	
7			
188			103 0 9
£11,331	Carried forward		£9,241 0 7

25, 1904.

Corresponding figures for 1903.

Expenditure.

COST OF ERECTION OF SHOWYARD:—

	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
7,708	7,708			4,905	9	2						
350				265	4	6						
7,358				4,640	4	8						
4,906				128	7	9						
2,452				4,511	16	11						
				2,255	18	5						
							2,255	18	6			
				595	10	9						
				397	0	6						
							198	10	3			
							2,454	8	9			
225							87	6	7			
94							26	1	4			
63							26	14	4			
1,351							1,193	12	8			
320							102	0	5			
620							25	2	11			
427							265	14	6			
47							14	5	4			
57							31	14	0			
4,622							2,221	1	3			
504							452	16	10			
26							110	13	2			
10,872							28	5	9			
1,778										7,041	17	10
9,094										1,351	14	4
												5,690 3 6

EXPENSES AT HEAD OFFICE IN LONDON:—

1,149	Assistant Director's Salary, and proportion of Salaries of	1,050	15	9								
13	Ordinary Clerical Staff debited to Show Account											
183	Assistant Director's Expenses									7	1	2
1,345	Extra Clerical Assistance									49	2	8
												1,106 19 7

PRINTING:—

607	Printing of Prize Sheets, Entry Forms, Admission Orders, Circulars to Exhibitors, Prize Cards, Tickets, and Miscellaneous	485	9	2								
86	Programmes for Members									68	10	0
51	Plans of Showyard, including plans of routes									39	17	10
30	Large Plans of Showyard and Judging Rings									30	0	0
793	Printing of Catalogues									517	0	10
86	Binding of Catalogues									89	8	3
15	Carriage of Catalogues to Showyard									12	2	6
102	Printing Awards									84	0	0
26	Programmes of Jumping Competitions									28	12	6
1,796												1,355 1 1

ADVERTISING, BILL POSTING, AND PLACARDING:—

84	Advertising Closing of Entries in Newspapers	90	11	3								
2,295	Advertising Show in Newspapers, Contract for Bill Posting and Placarding, and Printing of Posters and Placards	2,395	16	10								
81	Press Visit, &c., before Show									72	18	0
2,460												2,579 6 1

POSTAGE, CARRIAGE, &C.:—

120	General Postage, 73l. 10s. 9d.; Postage of Tickets to Members, 33l. 12s. 7d.; Carriage of Luggage, 5l.									112	3	4
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AMOUNT OF PRIZES AWARDED (for details see page xxii) .

4,499 0 0

COST OF FORAGE FOR LIVE STOCK:—

835	Hay, 150l. 18s. 11d.; Straw, 309l. 14s. 6d.; Green Food, 243l. 12s.									704	5	5
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JUDGES' FEES AND EXPENSES:—

97	Judges of Miscellaneous Implements.	46	3	0								
642	Judges of Horses, 63l. 9s. 10d.; Cattle, 131l. 9s. 11d.; Sheep, 118l. 8s. 4d.; Pigs, 32l. 9s. 9d.; Poultry, 25l. 12s. 8d.; Butter and Butter-making, 28l. 19s.; Cheese, 5l. 7s. 6d.; Cider and Perry, 8l. 12s. 4d.; Corn, 5l. 10s.; Wool, 6l. 15s.; Hops, 5l.; Horse-shoeing, 39l. 4s.; Trotting, 2l. 2s.	475	0	4								
739										521	3	4

£22,629

Carried forward

£16,548 2 4

Corresponding figures for 1903.

Receipts (contd.).

		£	s.	d.	£	s.	d.
11,331	Brought forward				9,241	0	7
ADMISSIONS TO SHOWYARD:—							
659	Tuesday, June 21, @ 5s.	491	8	0			
1,430	Wednesday, June 22, @ 2s. 6d.	975	2	0			
1,370	Thursday, June 23, @ 2s. 6d.	1,042	19	3			
999	Friday, June 24, @ 1s.	302	6	0			
885	Saturday, June 25, @ 1s.	352	16	0			
202	Day Tickets	61	19	6			
46	Season Tickets	28	12	0			
—	Railway Admission Tickets	717	2	6			
5,591					3,972	5	3
ENTRANCES TO HORSE RING:—							
240	Wednesday, June 22	197	13	0			
211	Thursday, June 23	179	7	0			
113	Friday, June 24	98	18	6			
58	Saturday, June 25	153	12	6			
773	Tickets sold for Reserved Enclosure	337	3	6			
62	Ladies' Tickets	9	10	6			
1,457					976	5	0
DAIRY:—							
7	Receipts at Stand at Dairy	3	5	9			
121	Sales of Produce at Dairy	96	16	10			
128							
113					100	2	7
—	Auction Sales in Showyard: Share of Commission				164	19	5
9,681	Contribution to Expenses (Mr. A. T. T. Peterson)				20	0	0
	BALANCE TO DEBIT OF SHOW OF 1904				6,920	9	10

STATEMENT OF PRIZES AWARDED:—

		£	s.	d.
1,632	Horses	1,253	0	0
2,649	Cattle	1,786	0	0
1,509	Sheep	1,267	15	0
471	Pigs	375	0	0
237	Poultry	176	15	0
155	Cheese and Butter	99	0	0
40	Cider and Perry	40	0	0
110	Corn, Wool, and Hops	98	0	0
32	Horse-shoeing!	32	0	0
201	Horse-jumping (including Entry Fees)	246	10	0
107	Other Horse Competitions			
50	Butter-making	35	0	0
70	Implements			
40	Contribution to Bee Department	40	0	0
7,303		5,449	0	0
Less:—				
	Prizes given by various Societies	903	10	0
1,064	Fees received in Horse-Jumping	46	10	0
		950	0	0
6,239		4,499	0	0
£28,301				
				£21,395 2 8

ERNEST CLARKE, Secretary.

WELTON, JONES & CO., Accountants.

Corresponding figures for 1903.

Expenditure (*contd.*).

		£ s. d.	£ s. d.
22,629	Brought forward		16,548 2 4
74	Badges for Judges and other officials		21 7 6
39	Rosettes		37 17 5
EXPENSES OF ADMINISTRATION :—			
152	Stewards:—Personal and Railway Expenses charged to Society	40 5 3	
160 {	Assistant Stewards :—Honoraria, 62 <i>l.</i> ; Lodgings, 30 <i>l.</i> ;	114 4 3	
	Expenses, 22 <i>l.</i> 4 <i>s.</i> 3 <i>d.</i>		
59 {	Official Staff:—Lodgings, 6 <i>l.</i> 4 <i>s.</i> ; Maintenance of Clerks,	52 4 1	
	39 <i>l.</i> 4 <i>s.</i> 6 <i>d.</i> ; Travelling Expenses, 6 <i>l.</i> 15 <i>s.</i> 7 <i>d.</i>		
166 {	Finance Office: Superintendent of Turnstiles, 10 <i>l.</i> 10 <i>s.</i> ;		
	Assistant Superintendent, 5 <i>l.</i> 5 <i>s.</i> ; Grand Stand Men,	124 8 6	
	32 <i>l.</i> 18 <i>s.</i> 6 <i>d.</i> ; Turnstile Men, 34 <i>l.</i> 10 <i>s.</i> ; Bank Clerks, 41 <i>l.</i> 5 <i>s.</i> ;		
52	Awards Office:—Clerks, 33 <i>l.</i> 5 <i>s.</i> 2 <i>d.</i> ; Awards Boys, 6 <i>l.</i> 19 <i>s.</i> 8 <i>d.</i>	40 4 10	
589			371 6 11
General Management :—			
166	Foreman and Assistant Foremen	80 1 4	
716	Yardmen, Grooms, and Foddermen	345 0 6	
175	Door and Gate Keepers	75 9 0	
54	Carriage and Horse Hire	39 12 0	
96	Veterinary Department :—Veterinary Inspectors	57 12 6	
135 {	Engineering Department:—Consulting Engineer and Assis-	111 8 2	
	tants, 97 <i>l.</i> 14 <i>s.</i> 2 <i>d.</i> ; Wages to Workmen, &c., 13 <i>l.</i> 14 <i>s.</i>		
507 {	Police, &c.:—Metropolitan Police, 455 <i>l.</i> 10 <i>s.</i> ; Commis-	483 6 8	
	aires, 26 <i>l.</i> ; Messengers, 1 <i>l.</i> 16 <i>s.</i> 8 <i>d.</i>		
1,849			1,192 10 2
346 {	Dairy:—Cream, 36 <i>l.</i> 15 <i>s.</i> 3 <i>d.</i> ; Milk, 58 <i>l.</i> 12 <i>s.</i> 1 <i>d.</i> ; Ice,		
	17 <i>l.</i> 15 <i>s.</i> 6 <i>d.</i> ; Utensils, 66 <i>l.</i> 10 <i>s.</i> 4 <i>d.</i> ; Staff, 93 <i>l.</i> 9 <i>s.</i> 11 <i>d.</i> ;	291 13 3	
	Salt, 1 <i>l.</i> 19 <i>s.</i> 4 <i>d.</i> ; Miscellaneous Payments, 6 <i>l.</i> ; Butter		
	Tests, 10 <i>l.</i> 10 <i>s.</i> 10 <i>d.</i>		
19	Poultry :—Penning, Attendants and Food	29 16 10	
37 {	Horse-shoeing:—Hire of Forges, 19 <i>l.</i> 7 <i>s.</i> ; Coal, 2 <i>l.</i> 10 <i>s.</i> ; Nails,		
	2 <i>l.</i> ; Wages, Gratuities, &c., 10 <i>l.</i> 19 <i>s.</i> ; Refreshments,	35 18 1	
	1 <i>l.</i> 2 <i>s.</i> 1 <i>d.</i>		
—	Produce:—Watching and unpacking	24 4 0	
GENERAL SHOWYARD EXPENSES :—			
297	Military Band	172 8 9	
50	St. John Ambulance Association	50 0 0	
65	Official Luncheons	11 11 2	
155	Royal Pavilion, Furniture and Floral Decorations	178 0 0	
12	Gratuities to Bath Chairmen	12 0 0	
6	Carriage Enclosure	7 4 6	
167	Hire:—Furniture, Canvas, &c., 115 <i>l.</i> 7 <i>s.</i> 2 <i>d.</i> ; Chairs, 45 <i>l.</i> 12 <i>s.</i> 10 <i>d.</i>	161 0 0	
366 {	Miscellaneous:—Implement Trials, 1 <i>l.</i> 10 <i>s.</i> ; Slop Carts,		
	2 <i>l.</i> 13 <i>s.</i> ; Horse Hire, 48 <i>l.</i> 8 <i>s.</i> ; Jumping Competitions,		
	5 <i>l.</i> 0 <i>s.</i> 3 <i>d.</i> ; Telephones, 11 <i>l.</i> 4 <i>s.</i> ; Various Payments by	154 7 8	
	Secretary, 16 <i>l.</i> 17 <i>s.</i> 6 <i>d.</i> ; Ditto by Superintendent, 33 <i>l.</i>		
	0 <i>s.</i> 1 <i>d.</i> ; Telegraph Extension, 10 <i>l.</i> 10 <i>s.</i> 11 <i>d.</i> ; Alterations		
	to Royal Box and Guttering to Pavilion (cost 78 <i>l.</i> 9 <i>s.</i>		
	10 <i>d.</i>); 15 per cent. charged to 1904, 11 <i>l.</i> 15 <i>s.</i> 6 <i>d.</i> ; Repairs		
	to Lavatories, 7 <i>l.</i> 8 <i>s.</i> 5 <i>d.</i>		
21			
29 {	Education and Forestry Exhibitions:—Wages of Staff,	32 14 5	
	Printing, and Incidentals		
1,168			779 6 6
351			
—	Military Tournament		112 13 10
1,200 {	"Rent" charged to Show Account (Rates, Taxes, Interest)	1,772 15 5	
	Rent for use of Sleepers, Fixtures, Furniture, and Tools	177 10 5	
			1,950 5 10
£28,301			£21,395 2 8

Examined, audited, and found correct, this 1st day of December, 1904.

JONAS M. WEBB

HUBERT J. GREENWOOD

NEWELL P. SQUAREY

} Auditors on behalf of the Society.

PARK ROYAL, LIMITED.

FINANCIAL STATEMENT

Presented at the Statutory Meeting of Park Royal, Limited,
Held at 13 Hanover Square, London, W.,
On Tuesday, February 23, 1904.

1. PARK ROYAL, LIMITED, was incorporated on November 26, 1903, in order to carry into effect the following recommendations of the Site Committee of the Royal Agricultural Society in their Report of October 20, 1903, approved by the Council on November 4, 1903 [see Journal, Vol. 64, pp. lxxi-lxxiii] :—

Further developments of one and another kind, not agricultural in character, appear possible on the site; and these can obviously not be managed and controlled by the Council of the Royal Agricultural Society. Some organisation of a more specialised kind appears essential to deal with the great variety of matters connected with the administration of a property of this kind; even if there were not the paramount necessity of regularising in the form of tangible securities the money already borrowed on mortgage, and the money to be borrowed as a second charge upon the property.

After the most careful and prolonged consideration of this matter in all its bearings, the Site Committee are unanimously of opinion that the prompt and effective administration of Park Royal would for the future best be secured by making it a separate undertaking from the Society's ordinary operations. It would, of course, remain under the general jurisdiction of the Council, but its detailed administration throughout the year would be entrusted to a small number of persons, who would be nominees of the Council, appointed by and removable by them. The Committee think that the most satisfactory and expeditious manner of arranging this, and also for putting the various obligations charged upon the estate upon a proper financial basis, would be to create and register a private company (which might be called Park Royal, Limited).

The balance of the estimated value of the property when the Company was created, would be represented by shares of Park Royal, Limited. All these shares, with the exception of the few registered in the names of individuals (who will in any case be nominees of and trustees for the Society) in order to enable the Company to be formed under the general law, would be registered in the name of the Royal Agricultural Society.

2. The share capital of Park Royal, Limited, was fixed at 15,000*l.* in 15,000 shares of 1*l.* each, this sum being the estimated surplus value of the estate after providing for the mortgage (22,000*l.*) on the property, which has now been converted into an equivalent amount of 4 per cent. debenture stock of the Company. All the 15,000 shares of the Company with the exception of seven (held, as Trustees for the Society, by the seven signatories to the Memorandum of Association—the six Directors and Sir Ernest Clarke) have been registered in the name of the Royal Agricultural Society of England. The 22,000*l.* debenture stock has also been issued, under authority of a Trust Deed on behalf of the debenture stock holders, for whom Earl Cawdor, Sir John Thorold, Bart., and Mr. F. D. Lambert have consented to act as Trustees.

3. The Company came into possession of the Park Royal estate by formal transfer from the Royal Agricultural Society under an Agreement dated December 10, 1903. The property transferred by this Agreement to the Company consists of—

(I.) The freehold of 101 acres, 3 r., 5 p., of land situated in the parishes of Twyford and Willesden, which land was bought by the Royal Agricultural Society in 1901 for a total sum of 26,146*l.* 16*s.* 0*d.*, of which 22,000*l.* was, at the date of the transfer, on mortgage at 4 per cent. (now converted into 22,000*l.* 4 per cent. first mortgage debenture stock of this Company), and 4,146*l.* 16*s.* 0*d.* had been paid in cash out of the "Permanent Show Fund" raised by the Society.

(II.) A lease of two pieces of land adjoining, and amounting together to 15 acres, 2 r., 35 p., and a farmhouse known as Twyford Abbey Farm, held for 5 years from September 29, 1902, at a rental of 100*l.* a year, with an option during that period of purchasing the fee simple at the rate of 500*l.* per acre, with 1,000*l.* additional for the house and garden.

4. In addition to the land known as the Park Royal estate, the Company has acquired the benefit of the various improvements on the estate and in the approaches thereto which have been effected out of the "Permanent Show Fund" raised by the Royal Agricultural Society for this purpose, and administered by the Site Committee—the predecessors of the Directors of this Company. Up to the date of the formation of the Company, the sum of 28,440*l.* 17*s.* 9*d.* had been received on capital account for the Permanent Show Fund, 27,557*l.* 7*s.*, representing actual donations, and the balance of 883*l.* 10*s.* 9*d.* representing interest and other miscellaneous items [for the details, see Journal, Vol. 64, pp. clxxii-clxxiv]. Of this sum, 4,146*l.* 16*s.* had been paid in cash on account of the purchase price of the land, 19,493*l.* 16*s.* 9*d.* had been spent for various improvements to the property, 2,245*l.* 12*s.* 1*d.* for preliminary expenses of 1901-1902, and 550*l.* 13*s.* 8*d.* for expenses in the formation of this Company itself. In addition, the fund had received from the Royal Agricultural Society the sum of 1,200*l.* in respect of the "rent" payable for the use of the ground for the Show year ended September 30, 1903, and had spent against such rent a total sum of 1,048*l.* 8*s.* 3*d.*, thus leaving a balance of 151*l.* 11*s.* 9*d.* to be carried forward.

5. The net result of these operations is that on December 31, 1903, when the functions of the Site Committee came to an end, there was a balance of 2,155*l.* 11*s.* 0*d.* unexpended of the Permanent Show Fund; and under the Agreement of December 10, 1903, any such balance was to be paid over to this Company, who are to apply the same in completing such of the works as were then in progress, and in executing such further works as may be agreed upon, and otherwise for the objects and purposes of the Company. The Company will moreover have the benefit of an additional 1,000*l.*, the balance due in 1905 of a donation already promised to the Society, and of the proceeds of the remainder of the hay made on the ground in 1902, and now valued at 310*l.*

6. Since the registration of the Company, the Directors have held frequent meetings with the view of settling the procedure of the Company and the administration of its affairs, particularly as to the letting of the ground for

other purposes in addition to the Royal Agricultural Society's Show. Negotiations have been practically concluded with a prominent football club for the use of the large ring for football purposes during the winter months. The chief source of revenue to the Company will, however, at any rate for the present, be the rent payable by the Royal Agricultural Society for the user of the ground for the purposes of its Annual Exhibition of Live Stock, Implements, and Produce. The amount of such rent for the now current Show year, which commenced on October 1 last, has yet to be settled with the Society; but the Company has in hand the unexhausted balance of 151*l.* 11*s.* 9*d.* from the rent of the round figure of 1,200*l.* paid by the Society to the Site Committee in respect of the first Show year ended September 30, 1903, together with 500*l.* paid on account in January, 1904, by the Society to this Company to enable it to pay various accounts for interest on borrowed money, rates, taxes, &c., chargeable against such rent for the current year.

7. It is obviously necessary, in order that the Company may be in a position to undertake the further works required for the development of the yard, and to arrange for the sub-letting of the ground, that it should be in possession of an adequate plant for the purpose. It has already been agreed in principle that the whole of the plant belonging to the Royal Agricultural Society, now valued at 3,559*l.* 3*s.* 2*d.*, and the timber purchased in 1903, now standing in the Society's books at 4,640*l.* 4*s.* 8*d.* (8,199*l.* 7*s.* 10*d.* in all), shall be transferred to this Company, and that arrangements should be made for the erection of the buildings, shedding, &c., required for the Society's Show of 1904 by this Company acting as contractors, payment by the Society to be based as regards the Company's existing buildings and materials on their estimated life, and as regards labour on the ascertained cost, plus a percentage to be agreed upon to cover the salaries of Mr. Burgess and assistants, and other expenses.

8. The full realisation of this arrangement must, however, depend upon the raising by the Company of further capital to enable it, amongst other things, to pay cash for the plant and timber at their estimated value when transferred. It is proposed to issue the further capital required for the development of the Company's property in the form of debenture stock, bearing interest at 5 per cent., and the Directors will be glad to receive promises of subscriptions to this stock when they are ready to allot it.

9. For the moment, therefore, the plant now on the show-ground which is in the form of Pavilions, Offices, Western Entrances, timber and miscellaneous plant required for the working of the annual Show, remain in possession of the Royal Agricultural Society. But as it is essential for the general working of this Company that certain descriptions of plant (horses, harness, stable and other fittings, carts, tools, railway sleepers, &c.) should be immediately under the control of the Company, it has been arranged that these shall be taken over by the Company at once at the amount (877*l.* 4*s.* 10*d.*) at which they appear in the Valuation already made, and shall be paid for by the Company out of the surplus of the Permanent Show Fund referred to in paragraph 5.

Signed on behalf of the Directors:

DERBY,
Chairman.

January 23, 1904.

PARK ROYAL, LIMITED.

REPORT OF THE DIRECTORS

AND STATEMENT OF ACCOUNTS TO SEPTEMBER 30, 1904.

Presented at the Ordinary General Meeting, held at
13 Hanover Square, W., on Tuesday, January 31, 1905.

Directors:

THE LORD MIDDLETON (*Chairman*).

THE EARL OF DERBY, K.G.

SIR WALTER GILBEY, BART.

COL. SIR NIGEL KINGSCOTE, G.C.V.O., K.C.B.

MR. PERCY CRUTCHLEY

MR. GEORGE H. SANDAY

} *Joint Managing Directors.*

1. The Directors present their First Annual Report and Balance-sheet to September 30, 1904.

2. The Company took over from the Royal Agricultural Society the following assets: Land and Development, 33,686*l.* 0*s.* 9*d.*; the unexpended balance of the "Permanent Show Fund" Account, amounting to 2,155*l.* 11*s.* 0*d.*; an additional 1,000*l.* (the balance due in 1905 of a donation already promised to the Society); and three ricks of hay valued at 310*l.*

3. During the period of the account a further sum of 2,060*l.* 1*s.* 4*d.* has been expended in developing and improving the property, the purchase of plant, the provision of an additional water supply, and additions to Grand Stands, &c., as shown in the Balance-sheet.

4. The work in connection with the erection of buildings and preparation for the Royal Agricultural Show of 1904, was carried out by the Company at a cost of 5,986*l.* 8*s.* 9*d.*, and expenditure was incurred on account of rates, taxes, interest on mortgage, &c., amounting to 2,101*l.* 17*s.* 7*d.*, in addition to 137*l.* 11*s.* 10*d.* for hay, eaves guttering, &c. At the date of the Balance-sheet there was still due from the Royal Agricultural Society, on account of the above, the sum of 2,902*l.* 4*s.* 10*d.*

5. Arrangements have been completed with the Queen's Park Rangers Football Club, for the use of the large ring for purposes of football during the winter months for a term of seven, fourteen, or twenty-one years, terminable by either party at the end of each period, at an annual rental of 350*l.*

for the first two years, and 400*l.* per annum after. In addition to this, when the gross takings at any one match other than a cup tie exceed 550*l.*, the Club is to pay to the Company one-half of the receipts in excess of that sum, and in the event of the Football Association requiring the ground for a match, the Club to pay to the Company one-third of any money received from the Association.

6. Facilities have also been provided for three local Football Clubs during the season, and it is hoped that the demand for further grounds will be augmented in the future.

7. The grass keep has been let from September, 1904, to May, 1905, at a rental of 60*l.*

8. The purchase of the site of the Plumes Tavern has been completed, and a Lease granted to the Middlesex Public House Trust Company for a term of ninety-nine years from Lady Day, 1904, at a yearly ground rent of 38*l.*, provision being made for power to expropriate the house and land acquired under the lease upon six months' notice at any time between Lady Day, 1909, and Lady Day, 1925, at a price equal to the capital sum expended and cumulative interest at the rate of 5 per cent.

9. The Hon. Cecil T. Parker having resigned his seat on the Board, the vacancy was recently filled by the election of Lord Middleton.

10. It has been considered desirable that the system of auditing the Company's accounts should be made uniform with that adopted by the Royal Agricultural Society, by the appointment as Auditors of the Company of the same three gentlemen who are appointed annually by the Members of the Royal Agricultural Society in General Meeting to audit the Society's accounts with the assistance of Professional Accountants of Messrs. Welton, Jones & Co. To facilitate this being done, the Auditors originally appointed by the Directors on the formation of the Company (Mr. J. F. Bond, of Welton, Jones & Co., and Sir Ernest Clark), expressed their readiness to retire from the post of Auditors in favour of the three gentlemen above referred to. Accordingly, the Directors formally appointed as Auditors of the Company Messrs. Jonas M. Webb, Hubert J. Greenwood, and Newell P. Squarey, by whom the accounts now presented have been audited and certified as correct.

11. The Directors retiring at this meeting in accordance with the Articles of Association, are: Sir Walter Gilbey, Bart., and Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., who are eligible and willing to be re-elected.

12. The Auditors, Mr. Jonas M. Webb, Mr. Newell P. Squarey, and Mr. Hubert J. Greenwood, retire in accordance with the Companies Act, 1900, and are eligible for re-appointment.

(Signed)

MIDDLETON,
PERCY CRUTCHLEY, } *Directors.*

Registered Office of the Company :

Eastern Entrances,

Abbey Road,

Willesden, N.W.

R. S. BURGESS, *Secretary.*

PARK ROYAL, LIMITED.

REVENUE ACCOUNT FOR THE PERIOD FROM NOVEMBER 26, 1903, TO SEPTEMBER 30, 1904.

Dr.

Cr.

	£	s.	d.	£	s.	d.	£	s.	d.
To Rents Payable	95	4	2						
" Rates and Taxes	490	16	8				2,101	17	7
" Water Rates	92	18	4				196	11	10
" Interest on Mortgage	837	16	9				83	1	4
" Contribution to Roads	224	9	2						
" Depreciation on Plant, Water Pipes, &c.	308	8	11						
" Miscellaneous Tools	11	8	2						
" Sundries	319	17	1				35	6	0
" Administration—	11	17	9						
Salaries	73	10	0						
Wages	32	8	1						
General Repairs	25	0	2						
Stationery and Sundry Expenses	20	19	8						
Insurance	4	14	8						
Bank Interest and Charges	3	8	9						
Legal Expenses	55	2	0						
Balance carried to Balance-sheet	215	3	4						
	128	13	6						
	£2,416	16	9				£2,416	16	9

PARK ROYAL, LIMITED: BALANCE-SHEET, SEPTEMBER 30, 1904.

	£	s.	d.	£	s.	d.	£	s.	d.
Ordinary Shares									
Mortgage Debenture Stock			15,000	0	0				
Debenture Interest Accrued			22,000	0	0				
Sundry Creditors			418	0	0	33,686	0	9	
Due to Bank in respect of Advances			516	3	7				
			1,761	14	3				
Revenue Account—									
Balance for the period from November 26, 1903, to									
September 30, 1904			128	13	6				
Land and Development—									
Amount taken over from R.A.S.E. as									
at Incorporation of Company						33,686	0	9	
Add Further Expenditure to September									
30, 1904—									
Levelling, Draining, &c.						418	3	0	
Iron Fencing						5	10	10	
New Eastern Entrances						9	11	7	
Roads and Sewers Inside						286	11	5	
Water Pipes and Fittings						474	2	3	
Fixtures in House						22	7	0	
Sleepers						300	0	0	
Office Furniture						47	11	0	
Grand Stands (additions)						496	4	3	
Less Depreciation						35,746	2	1	
						308	8	11	
Horses, Vehicles, Harness, Tools, &c.						419	4	3	
Less Depreciation on Miscellaneous Tools						11	8	2	
Tavern Site									
Balance of Hay not sold (1902 Crop)									
Sundry Debtors									
R.A.S.E. Rent Account						950	5	10	
Do. Showyard Works						1,814	7	2	
Do. Various						137	11	10	
Sundries						38	7	2	
Queen's Park Rangers						95	4	3	
Expenditure on a/c 1905 Show									
Cash in hand									
						3,035	16	3	
						128	10	0	
						45	13	7	
						£39,824	11	4	

XXX

MIDDLETON,
PERCY CRUTCHLEY, } Directors.

R. S. BURGESS, Secretary.

In accordance with the provisions of the Companies Act, 1900, we certify that all our requirements as Auditors have been complied with. We have to report to the Shareholders that we have audited the above Balance-sheet, and in our opinion such Balance-sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs as shown by the books of the Company.

WELTON, JONES & Co., Chartered Accountants.
January 18, 1905.
JONAS M WEBB,
NEWELL P. SQUAREY, } Auditors.
HUBERT J. GREENWOOD,

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Proceedings of the Council.

WEDNESDAY, FEBRUARY 3, 1904.

THE EARL OF DERBY, K.G. (PRESIDENT) IN THE CHAIR.

Present:

Trustees.—The Earl of Coventry, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B.

Vice-Presidents.—H. R. H. Prince Christian, K.G., the Earl of Jersey, G.C.B., Lord Moreton, The Hon. Cecil T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Mr. Alfred Ashworth, Mr. J. Bowen-Jones, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, the Hon. A. E. Fellowes, M.P., Mr. W. Frankish, the Marquis of Granby, Mr. R. Neville Grenville, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Capt. W. S. B. Levett, Mr. Joseph Martin, Lord Middleton, Mr. T. H. Miller, Sir P. Albert Muntz, Bart., M.P., Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. C. C. Rogers, Mr. Howard P. Ryland, Mr. E. W. Shackle, Mr. A. J. Smith, Mr. E. W. Stanyforth, Mr. R. Stratton, Mr. Martin J. Sutton, Mr. J. P. Terry, Lord Wenlock, G.C.S.I., Mr. E. V. V. Wheeler.

Election of New Members.

The minutes of the last meeting of the Council, held on December 9, 1903, having been taken as read and approved, the election of thirty-one new members was proceeded with.

The Reports of the various Committees were presented and adopted as below :—

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the month ended December 31, 1903, as certified by the Society's Accountants,

showed total receipts amounting to 1,831*l.* 17*s.* 2*d.*, and expenditure amounting to 2,325*l.* 13*s.* 10*d.* The accounts for the month ended January 30, 1904, which were also presented, showed total receipts amounting to 4,743*l.* 2*s.* 11*d.*, and expenditure amounting to 2,504*l.* 2*s.* 1*d.* Accounts amounting in all to 3,006*l.* 3*s.* 9*d.* had been passed, and were recommended for payment.

House.

Sir NIGEL KINGSCOTE (Chairman) reported that the question of letting the Society's Council Room for the meetings of other societies, raised by Surgeon Lt.-Col. Ince at the General Meeting on December 10 last, would be considered by the Committee as opportunities arose.

Journal.

Mr. ASHWORTH reported the Committee's recommendation that the cordial thanks of the Council be given to Mr. William Robinson, of Gravetye Manor, Sussex, for his gift to the Society's Library of Vol. 1 of his "Flora and Sylva."

Chemical and Woburn.

Mr. BOWEN-JONES (Chairman) presented a Report by the Consulting Chemist, which the Committee recommended for publication with the Proceedings of the Council, as follows :—

Report of Consulting Chemist.

I. AGRICULTURAL SULPHATE OF COPPER.

In view of the considerable use of sulphate of copper on the farm, it is considered desirable to call special attention to the following case concerning a purchase of sulphate of copper for agricultural purposes.

A member of the Society, intending to use sulphate of copper for the spraying of charlock and for dressing sheep against foot rot, ordered from an Association, of which he was a member, on June 16, 1903, 1 cwt. of sulphate of copper, stipulating that this should be pure.

This was obtained by the Association from a firm of wholesale druggists, being invoiced to the Association as follows:—
"1 cwt. Pulv. Cupri Sulph. Pur. at 30s."
It was in turn invoiced to the member as:—

"1 cwt. Sulphate of Copper, 35s."

Subsequent to this purchase the member in question, wishing to have a further lot, gave an order on June 29, 1903, for 2 cwt. more. The order was given verbally to be the same as the previous lot. The order was sent on to the same firm of wholesale druggists, but it appears that, owing to the absence of the manager of the Association at the time, the order was given for sulphate of copper, but without any stipulation as to purity.

The firm of wholesale druggists, on receiving the order, sent to the Association what was invoiced to them as:—
"2 cwt. Agric. Sulphate Copper at 16s."
this being just about half the price of the previous lot.

The 2 cwt. was duly delivered to the member, and was invoiced to him as follows:—

"July 1, 1903.—2 cwt. Sulphate of Copper, 31. 10s."

The member, however, being suspicious of its appearance, sent to Dr. Voelcker a sample on July 7 for analysis. Previous to this, namely, on July 3, the manager of the Association had written to the firm of wholesale druggists inquiring whether the price charged the Association was the right one, and in reply was told (by letter of July 6) that "the prices were correct, as the order for 2 cwt. June 29 only said 'Sul. Copper.' We took this literally, and sent in *lump* and *agricultural* quality."

Dr. Voelcker analysed the sample, and his certificate, dated July 11, 1903, showed that the material contained only 14.03 per cent. of sulphate of copper, while 85.55 per cent. consisted of sulphate of iron, the actual value of the material being only about 5*l.* a ton, instead of 35*l.*, the rate at which the pure sulphate of copper was sold.

On the member complaining about the material, the Association wrote to the firm who supplied them, and obtained the answer:—"The article sent you is a commercial one, invoiced by makers and brokers alike as 'Agricultural Sulphate of Copper.'" The firm added that they got it without any guarantee, and sold it without any, and were not aware that it was an article understood to be of any definite quality.

The Association explained to the member that the invoicing to him of the 2 cwt. at the same price as before, and not at one-half the price, was an unintentional mistake made in their office, and they expressed their readiness to credit the purchaser with the whole amount of the transaction.

Granting that there was no intention to defraud the member, either as to the quality or the price charged him, there remains the fact that an order for sulphate of copper given to a firm of wholesale druggists was met by the supply of an article called "Agricultural Sulphate of Copper," which contained only 14 per cent. sulphate of copper instead of the 98 per cent. which should be present in the genuine article, and at a price about one-half that of the genuine article. It is clearly most unsatisfactory that, when a material like sulphate of copper is ordered, unless there is a definite guarantee of purity stipulated for, a material can be supplied with the "covering qualification" "agricultural," which may be of such nature as here represented. Equally unsatisfactory is the conclusion to be drawn that, because an article is for *agricultural* purposes, it may therefore be a grossly adulterated one.

II. SULPHATE OF POTASH.

In a case recently reported (see Vol. 64, 1903, page lxxv) attention was called to the sale, under the name "Sulphate of Potash," of an article that contained some amount of carbonate of potash. It was pointed out that if this material were mixed with sulphate of ammonia—as might be the case in making a mixture of manures for potatoes, &c.—a loss of ammonia might occur on account of the alkaline character of the sulphate of potash.

It has since transpired that there are on the market two kinds of sulphate of potash, the one the commercially pure salt, sulphate of potash, supplied from the German potash mines at Stassfurt. This is neutral, and free from carbonates of potash or soda, and can be used quite well by farmers for mixing with sulphate of ammonia and other ammonia-containing materials.

The other, a less pure sulphate of potash, is obtained as a recovery product from the manufacture of beetroot sugar, and is manufactured considerably in Austria and elsewhere on the Continent. This salt contains some quantity of the carbonates of potash and soda, as well as other salts, and has an alkaline reaction. It is usual to sell it on the basis of the potash it contains, and for the manufacture of artificial manures it can be used quite well, and doubtless more economically than the pure salt. But it is well to warn the agriculturist who purchases the ingredients of mixed manures separately that it will not do to mix this material with sulphate of ammonia and other ammoniacal materials, and if he is making up for himself a mixed manure of this class, he should stipulate for being supplied with the *pure* sulphate of potash.

J. AUGUSTUS VOELCKER.

February 2, 1904.

Botanical and Zoological.

Mr. WHEELER (Chairman) presented recommendations as to the preparation of exhibits for the British Forestry Exhibition at Park Royal.

Veterinary.

The Hon. CECIL PARKER (Chairman) reported that the Committee had considered a suggestion, made by Mr. William Fortune at the General Meeting on December 10 last, that a prize be offered for the invention of an apparatus to slaughter animals more expeditiously and painlessly than at present; but as it was understood that the question of humane methods of slaughtering animals was at present under investigation by a Government Committee, the Committee proposed to reserve any action.

Stock Prizes.

Mr. SANDAY (Chairman) reported the issue of the Prize Sheet for the Society's Sixty-fifth Annual Exhibition. The total value of the prizes, including Champion prizes and Medals offered by Breed Societies (1,165*l.*), amounted to 6,068*l.*

Mr. ASHWORTH expressed the hope that the Stock Prizes Committee were considering the question of the small number of entries in the horse classes, and particularly of the light horses.

Implement.

Mr. FRANKISH (Chairman) reported that a circular-letter had been issued to nurserymen offering them open ground space for the exhibition of forest seedling trees and transplants in connection with the proposed British Forestry Exhibition; and it had also been arranged that facilities should be provided for the exhibition of forestry tools and appliances by manufacturers.

General Show.

The Earl of JERSEY (Chairman) reported the Committee's recommendation that a military display be held on the afternoon of Saturday, June 25, in the Large Ring at the Society's Show at Park Royal next June.

Showyard Works.

Mr. CRUTCHLEY (Chairman) presented various recommendations relating to insurance, postal and telegraphic facilities, refreshments, and other matters. The Committee also recommended the adoption of a contract for the advertising of the Show of 1904 at a total cost to the Society of 2,353*l.*

A discussion, in which the Hon. CECIL PARKER, Mr. STRATTON, the Marquis of GRANBY, Mr. MARTIN SUTTON, Lord MORETON, Mr. RANSOME, Sir WALTER GILBEY, Sir JACOB WILSON, the PRESIDENT, and Mr. MARTIN took part, arose as to the advertising of the Show, to which Mr. CRUTCHLEY replied; and eventually the Report of the Committee was adopted.

Selection.

Sir JACOB WILSON reported that the Committee had discussed the question of the present method of election to the Council and would give further consideration to the matter in March. The Committee reported with regret the resignation of his seat on the Council by Mr. Henry Smith, of Cropwell Butler. They would be glad to consider any suggestions which might be made to them by Members of the Society as to filling up this vacancy, and the other vacancy caused by the election of Mr. Victor Cavendish as a Vice-President.

Education.

Lord MORETON (Chairman) reported that progress was being made with the detailed arrangements for the Agricultural Education and British Forestry Exhibitions to be held in connection with the Society's Show at Park Royal next June. The Committee recommended that Mr. Alfred Ashworth be appointed as the Society's Representative Governor upon the Sandbach School and Almshouse Foundation for a period of five years, commencing February 3, 1904.

Dairy and Produce.

Mr. DUGDALE (Chairman) reported that the Committee had considered the suggestions made by Mr. Eldred Walker at the General Meeting of Members on December 10, and they recommended a reply to the effect that every effort would be made to open the Produce Section immediately the judging was finished; that the analyses of cider and perry submitted to the Judges would be published; and that arrangements had been made for an increase of the time during which persons interested could taste the cider and perry exhibited.

Miscellaneous.

The seal of the Society was authorised to be affixed to a new certificate of Harewood House stock, and to a form of proxy to the Secretary to vote at meetings of Park Royal

Limited, during the forthcoming year, in respect of the 14,993 shares of that Company, registered in the corporate name of the Society. A statement as to the capital expenditure on the Park Royal estate was laid upon the table.

WEDNESDAY, MARCH 2, 1904.**THE EARL OF DERBY, K.G. (PRESIDENT), IN THE CHAIR.****Present:**

Trustees.—Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., the Earl of Feverham, the Earl of Jersey, G.C.B., the Hon. Cecil T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Mr. Alfred Ashworth, Mr. R. C. Assheton, Mr. J. Bowen-Jones, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, the Hon. A. E. Fellowes, M.P., Mr. W. Frankish, Mr. R. M. Greaves, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Capt. W. S. B. Levett, Mr. Joseph Martin, Mr. T. H. Miller, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. E. W. Shackie, Mr. A. J. Smith, Mr. R. Stratton, Mr. Martin J. Sutton, Mr. J. P. Terry, Lord Wenlock, G.C.S.I., Mr. C. W. Wilson.

Election of New Members.

The minutes of the last meeting of the Council, held on February 3, 1904, having been taken as read and approved, the election of twenty-three new Members was proceeded with.

The Reports of the various Standing Committees were then presented and adopted as below:—

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the month of February, 1904, showed receipts amounting to 3,773*l.* 4*s.* (including a further advance to the account of 1,500*l.*), and expenditure amounting to 5,006*l.* 4*s.* 8*d.* Accounts amounting in all to 1,978*l.* 0*s.* 1*d.* had been passed.

Journal.

Sir JOHN THOROLD (Chairman) reported that the Committee recommended the publication of two pamphlets on Fruit and Vegetable Farming, which had been written respectively by Mr. Charles Whitehead and Mr. James Udale.

Chemical and Woburn.

Mr. BOWEN-JONES (Chairman) reported that the Committee had had before them two cases of adulteration of feeding stuffs with rice husks and coffee-bean husks respectively. In the first case the material (rice meal), charged at 4*l.* 2*s.* 6*d.* per ton ex warehouse, was found on analysis to be simply the ground up husks of the rice grain. It contained 12·83 per cent. of silicious matter, and was not worth 10*s.* per ton. The vendors, on being asked to account for it, said that they bought it on the London market. They took back what the purchaser had not used, and met him half-way in respect of what had been consumed. In the second case, a sample of bran was found on analysis by Dr. Voelcker to contain an admixture of coffee-bean husks, which are useless for feeding purposes. The price charged, 4*l.* 15*s.* per ton, was that of good wheat bran. The explanation of the vendors was that they—though millers—could not produce enough bran themselves, but had to buy; and they asserted that, though the purchaser ordered “bran,” he did not specify “guaranteed bran,” and therefore he was given a material which was produced in London. It was perhaps hardly necessary for the Committee to point out that bran is a product of wheat only, and that in purchasing bran it is not necessary to specify guaranteed bran.

Dr. Voelcker had brought before the Committee details of trials which had been conducted during the past season at the Society's Woburn Experimental Station on the growth of Canadian wheat on English soil. The general conclusion arrived at showed that, while the yield of good Canadian wheat was considerably below that of English wheat, the Canadian wheat was stronger, more nitrogenous, and produced a loaf which, from the baker's point of view, was more satisfactory. Moreover, although the Canadian wheat had been grown for two successive seasons in England, it had been found to retain in a large measure its original characteristics.

Botanical and Zoological.

Sir JOHN THOROLD reported a recommendation of the Committee that the Consulting Chemist and Consulting Botanist be instructed to inspect during the forthcoming season the plots upon which the Society's Grass Experiments were conducted, and to present a joint Report upon their condition (see page 316).

Veterinary.

The Hon. CECIL PARKER (Chairman) reported the Committee's recommendation that the Earl of Feversham be nominated for re-election as the Society's representative on the Council of the Lister Institute of Preventive Medicine at the annual general meeting of the Institute to be held on April 29 next.

Stock Prizes.

Mr. SANDAY (Chairman) reported that the Committee had further considered the operation of Regulation 31 of the prize sheet, as to the cancellation of classes in which there were less than three separate exhibitors, in connection with various communications received by them; but they were unable to recommend any relaxation of the rule. A letter had been received from the Polo and Riding Pony Society with reference to the dates (Friday and Saturday, June 24 and 25) proposed by the Stock Prizes Committee for the exhibition of the animals entered in the Polo Pony classes, which letter requested that such animals might be exhibited on the same days as the other

light horses (Tuesday, Wednesday, and Thursday, June 21, 22, and 23). After discussion in Committee, the settlement of the matter had been referred to the Honorary Director and to himself as Chairman.

Implement.

Mr. FRANKISH (Chairman) reported that the Allotment Committee appointed to allot the space in the Implement Department at the Society's Show of 1904 would meet on Wednesday, March 30.

General Show.

The Earl of JERSEY (Chairman) reported that the following noblemen and gentlemen had accepted the Society's invitation to become members of the Committee: The Lords-Lieutenant of London and Middlesex, the Lord Mayor and Sheriffs of London, the Chairmen of the London and Middlesex County Councils, and the Chairmen and General Managers of the Great Western, London and North-Western, and Metropolitan District Railway Companies. A Sub-committee, consisting of the President, the Honorary Director, Mr. Ransome, and Mr. Sutton, had been appointed to consider the arrangements for advertising the Show, and to confer with the railway companies as to the facilities to be provided by them.

Showyard Works.

Mr. CRUTCHLEY (Chairman) presented a report from this Committee relating to a large number of details connected with the Show of 1904.

Selection.

Sir JOHN THOROLD (Chairman) reported that the Committee had given further consideration to the question of the method of election to the Council. Having regard to the requirements of Clause 6 of the Society's Charter, they recommended that the customary formal summons to the Anniversary General Meeting in May, issued to members with the Journal, should be supplemented by a list of the twenty-three retiring Members of the Council, showing their attendances during the last two years, and by an explanation that the elections at the Anniversary Meeting are

conducted under the regulations prescribed by Clause 6 of the Charter, and the Society's Bye-law 23, of which extracts would be printed in the circular.

An intimation was also to be made on the circular that the Council would be much obliged if Members of the Society would be good enough to send to the Secretary suggestions of the names of Members of the Society suitable to serve on the Council, for consideration as vacancies occurred, and with due regard to the requirements of different districts and interests with claims to representation on the Council. In view of this circular, the Committee had reserved until the receipt of the replies the consideration of the two vacancies now existing on the Council. They were of the opinion that, in view of the recent death of the Earl of Ravensworth (Vice-President), and of the resignation of Mr. Henry Smith of Cropwell Butler, these two vacancies should, if possible, be filled up by the election of representatives of the counties of Durham and Nottingham, which had now no representation on the Council.

Mr. STRATTON said that, although the course proposed by the Committee of Selection did not completely meet his suggestion, he recognised that there

were difficulties arising out of the terms of the Charter which would preclude at present the full adoption of the plan he had advocated. He agreed that the present was hardly an appropriate moment for going to the expense of a Supplementary Charter, but if within a short time the Charter should have to be amended in other respects, the question of the method of electing the Council was one of the most important points to be considered.

Mr. SUTTON, in concurring with Mr. Stratton, added that he thought the issue of the proposed circular was a happy solution of the matter which had been under discussion.

Education.

Mr. SUTTON reported that progress was being made with the arrangements for the proposed British Forestry and Agricultural Education Exhibitions to be held in connection with the Society's Show at Park Royal next June.

Dairy and Produce.

Mr. ASSHETON reported the Committee's recommendation that the offer of Messrs. Marshall, Sons, and Co., Ltd., of Gainsborough, to lend a portable engine for use in the dairy in the showyard, be accepted with thanks.

WEDNESDAY, APRIL 13, 1904.

THE EARL OF DERBY, K.G. (PRESIDENT), IN THE CHAIR.

Present :

Trustees.—The Earl of Coventry, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., Mr. Victor C. W. Cavendish, M.P., Lord Moreton, the Hon. Cecil T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Mr. Alfred Ashworth, Mr. R. C. Assheton, Viscount Baring, Mr. J. Bowen-Jones, Mr. Percy Crutchley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, the Hon. A. E. Fellowes, M.P., Mr. W. Frankish, the Marquis of Granby,

Mr. R. M. Greaves, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. John Howard Howard, Mr. Henry D. Marshall, Mr. Joseph Martin, Lord Middleton, Mr. T. H. Miller, Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. Howard P. Ryland, Mr. E. W. Stanyforth, Mr. Martin J. Sutton, Mr. Garrett Taylor, Mr. E. V. Wheeler.

Election of New Governors and Members.

The minutes of the last meeting of the Council, held on March 2, 1904, having been taken as read and approved, the election of two Governors and thirty-six new members was proceeded with.

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the month of March, 1904, showed receipts amounting to 5,623*l.* 14*s.* 1*d.*, and expenditure amounting to 4,978*l.* 5*s.* 1*d.* (including the sum of 3,000*l.* repaid to the Society's bankers). Accounts amounting in all to 768*l.* 2*s.* 1*d.* had been passed.

Sir NIGEL KINGSCOTE also presented a Report by the Sub-committee appointed on December 9, 1903, "to consider and report to the Council what alterations, if any, should be made in the organisation and duties of the Staff in Hanover Square and at the showyard, and whether any and what economies in the general administration of the affairs of the Society can be effected, and in what way its revenues may be increased." After some preliminary discussion, it was decided that the report in question should be circulated amongst the Council with a view to its consideration at their next meeting, which was fixed for 11.30 a.m. on Wednesday, May 4.

Journal.

Sir JOHN THOROLD (Chairman) reported the issue of Volume 64 of the Journal, and the completion of the delivery of the copies to Members. The net cost of the production of this Volume had amounted to 1,398*l.*, as compared with 1,665*l.* for Volume 63, this representing a saving of 267*l.* The Committee recommended the publication as soon as ready of two pamphlets on Fruit and Vegetable Farming, prepared respectively by Mr. Charles Whitehead and Mr. James Udale. The price of these pamphlets had been fixed at one shilling each. They also recommended that in future Members of the Society be allowed the privilege of purchasing at half price copies of the Society's pamphlets that are issued at the price of not less than 1*s.*, the applications for copies to be made direct to the Society.

Chemical and Woburn.

Mr. BOWEN-JONES (Chairman) presented a Report relating to the Society's Experimental Farm at Woburn.

Botanical and Zoological.

Mr. WHEELER (Chairman) presented a Report from the Consulting Botanist, which stated that two mixtures, being the hay seeds grown on the farm to be used for sowing, contained the following ingredients, together with some chaff:—

	(1) Per cent.	(2) Per cent.
Trefoil	30	25
Rib grass	22	20
Suckling clover	14	15
Rye grass	13	17
Brome grass	9	7
Fescues	6	7
Cocksfoot	4	2½
Buttercup	½	2½
Sorrel	1	—
Chickweed	½	—
Dock	—	1½
Yorkshire fog	—	2½
	100	100

It was not necessary to observe how worthless such mixtures would be.

Veterinary.

The Hon. CECIL PARKER (Chairman) reported that the information reaching the Laboratory at the Royal Veterinary College indicated that since the beginning of the year the general health of farm stock had not been below the average in spite of the excessive rainfall, and the exceptional losses which were anticipated among sheep from "rot" had not so far been experienced in any part of the country.

Stock Prizes.

Mr. SANDAY (Chairman) reported that arrangements had been made in concert with the Polo and Riding Pony Society (who had generously made a grant of 25*l.* towards the prizes) for Bending and other Competitions for Polo Ponies to take place during the Show in June next.

Implement.

Mr. FRANKISH (Chairman) reported that the Allotment Sub-committee had met on Wednesday, March 30, and arranged the position of the Stands in the Implement Department of the showyard.

General Show.

The Hon. CECIL PARKER presented a Report relating to the detailed organisation of the Show of 1904.

Showyard Works.

Mr. CRUTCHLEY (Chairman) reported that the Committee had considered and passed the posters for advertising this year's Show, and had approved of letters to exhibitors asking them to assist the Society by the exhibition and distribution of hand-bills and window-bills.

Selection.

Sir JOHN THOROLD (Chairman) submitted, in accordance with Bye-law 23a, the list which had been prepared of the Members of Council who retired by rotation at the Anniversary General Meeting next month, showing the number of attendances at Council and Committee meetings of each of such Members during the past two years. Two Members of Council had not given the necessary number of attendances (two in each year) required by Bye-law 23b, and were, therefore, ineligible for re-election. There would thus be four vacancies on the Council to be filled up at the General Meeting. Various nominations for these vacancies had been received, and would, with any others received meanwhile, be published after the next Council Meeting on May 4, in accordance with Bye-law 23c.

The Committee reported with regret the death of Dr. C. J. Sikes van de Cloese, of The Hague, one of the Society's Honorary Members. They recommended that in his stead Mr. H. J. Lovink, Director-General of Agriculture at The Hague, be elected an Honorary Member of the Society.

Education.

Mr. SUTTON reported that seventy-five entries had been received for the forthcoming Examination for the National Diploma in Agriculture, viz., forty-seven entries in Part I. and

twenty-eight entries in Part II. The Committee had approved of the proposed apportionment of space between the various colleges that had accepted the Society's invitation to exhibit at the Agricultural Education Exhibition.

Dairy and Produce.

Mr. DUGDALE (Chairman) reported that various questions relating to the Dairy in the showyard had been brought before the Committee, and instructions given thereon.

Attendances at Meetings of Council and Committees from April, 1902, to March, 1904, inclusive	Council Meetings total number is	Committees	
		No. of Meetings	Attend- ances
BROUGHAM AND VAUX, LORD . . .	10	34	19
CURTIS-HAYWARD, LIEUT.-COL. J. F. . .	12	61	46
FOSTER, S. P. . . .	8	9	3
FRANKISH, WILLIAM GRANBY, MARQUIS OF	13	128	81
GRENVILLE, ROBERT NEVILLE	8	6	1
HOBBS, ROBERT W. (Elected Mar. 4, 1903)	15	101	34
HORNSEY, JAMES . . .	6	4	2
HOWARD, JOHN . . .	13	33	9
HOWARD	7	33	6
LEVETT, CAPTAIN W. S. B.	13	78	53
MARSHALL, HENRY D. MUNTZ, IR PHILIP	9	32	16
ALBERT, BT., M.P. . .	8	—	—
RANSOME, JAMES E. . .	10	39	14
ROGERS, CHARLES COLTMAN	7	56	16
RYLAND, HOWARD P. SCOBY, WILLIAM . . .	11	86	60
SCOBY, WILLIAM . . .	7	9	5
STRATTON, RICHARD SUTTON, MARTIN J. . .	11	28	8
SUTTON, MARTIN J. . .	12	48	27
WARREN, REGINALD AUGUSTUS	8	17	6
WHEELER, E. VIN- CENT V.	15	116	77
WILLIAMS, J. C. . . .	4	9	3

WEDNESDAY, MAY 4, 1904.

THE EARL OF DERBY, K.G. (PRESIDENT), IN THE CHAIR.

Present:

Trustees.—Earl Cawdor, the Earl of Coventry, Earl Egerton of Tatton, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Viscount Ridley, Earl Spencer, K.G., Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., Mr. Victor C. W. Cavendish, M.P., the Earl of Jersey, G.C.B., The Right Hon. Sir Massey Lopes, Bart., Lord Moreton, Mr. G. H. Sanday, Mr. Charles Whitehead, Sir Jacob Wilson.

Other Members of Council.—Mr. Alfred Ashworth, Viscount Baring, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, the Hon. A. E. Fellowes, M.P., Mr. S. P. Foster, Mr. W. Frankish, Mr. Hugh Gorrington, the Marquis of Granby, Mr. R. M. Greaves, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Mr. John Howard Howard, Captain W. S. B. Levett, Mr. Henry D. Marshall, Mr. Joseph Martin, Lord Middleton, Mr. T. H. Miller, Sir P. Albert Muntz, Bart., M.P., Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. C. C. Rogers, Mr. Howard P. Ryland, Mr. W. Scoby, Mr. E. W. Shackle, Mr. A. J. Smith, Mr. E. W. Stanforth, Mr. R. Stratton, Mr. Martin J. Sutton, Mr. Garrett Taylor, Mr. J. P. Terry, Mr. E. V. V. Wheeler, Mr. C. W. Wilson.

Election of New Governors and Members.

The minutes of the last meeting of the Council, held on April 13, 1904, having been taken as read and approved, the election of one Governor and forty-five new Members was proceeded with.

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the month of April, 1904, showed receipts amounting to 3,556*l.* 10*s.* 4*d.*, and expenditure amounting to 2,768*l.* 8*s.* 4*d.* (including the sum of 2,000*l.* repaid to the Society's Bankers).

Accounts amounting in all to 1,253*l.* 8*s.* 7*d.* had been passed. The Committee further reported that they had held a special meeting on April 18 for the purpose of settling with the Society's professional Accountants a new form of balance-sheet for the year 1903. This balance-sheet, with the statement of ordinary income and expenditure for 1903 [see pp. xii et seq.], had now been audited by the three Auditors appointed by the Members, and would be issued, as usual, with the Report of the Council to the Anniversary General Meeting on May 30.

Sub-Committee on Finance.

The Council then proceeded to take into consideration, the Report of the Sub-committee on Finance presented at the April meeting. On the motion of Sir NIGEL KINGSCOTE, it was resolved that this Report be considered in Committee of the whole Council, and a lengthy discussion ensued in Committee, in which many of those present took part. Eventually the Report was received and adopted, its recommendations—from the adoption of which it is expected that substantial economies will result—being referred to the several spending Committees concerned.

Journal.

Sir JOHN THOROLD (Chairman) reported that as there was now a constant demand for the Farm Account Books recommended by the Society in 1883, these books were about to be reprinted with slight amendments, and they would continue to be published for the Society as heretofore by Messrs. Forster, Groom & Co., of 15 Charing Cross, S.W. The Account Books consisted of (1) a Diary, combining the cash account with a daily record of all farm transactions, and (2) a Farm Account Book, showing payments and receipts, and supplying a form of annual balance-sheet. Whilst not doubting the value of other account books (especially the labour book, the cash book, the stock book,

and the ledger), the two simple books recommended by the Society were issued with the object of leading farmers who had hitherto kept no proper accounts to do so in future.

Chemical and Woburn.

Mr. REYNARD reported that the Committee's attention had been drawn to a case in which 10 to 20 tons of "nutmeal," at 50s. per ton, and 10 tons of "seeds," at 42s. 6d. per ton, were offered by a Hull firm to manufacturers of linseed cake. The samples sent were analysed by Dr. Voelcker, who found that the "nutmeal" consisted merely of the ground-up husks and skin of the seed of the earth nut or ground nut (*Arachis hypogea*), but without any of the kernel. The "seeds" were the screenings from clover seed, and consisted of grass seeds, plantain (rib-grass), corncockle, and numerous other weed seeds, worthless as food.

Botanical and Zoological.

Mr. WHEELER (Chairman) reported that authority had been given to Mr. Cecil Warburton, the Society's Zoologist, to give evidence before the Board of Agriculture Departmental Committee on Fruit Culture. Mr. Warburton had prepared a case of insects and specimens relating to forest trees for inclusion in the British Forestry Exhibition to be held in connection with the Society's Show.

Veterinary.

Sir JOHN THOROLD reported the issue of the reprint made by the Board of Agriculture, with the Society's permission, of the articles on "Liver Rot in Sheep," which appeared in the Journal from 1880 to 1883, and of the correspondence which had recently passed between the Board and the Society on the subject.

Further consideration had been given to the question of the establishment of an additional Veterinary College in England, and the Committee agreed unanimously to recommend the following resolution for adoption by the Council:—

That, looking to the long association of the Royal Veterinary College with the Royal Agricultural Society, this Council would regret any action that would be detrimental to the interests of

the College, and decides therefore to give its support to the representations made to the Secretary of State for the Home Department by the College in opposition to the proposed establishment of a second Veterinary College in England.

On the motion of Sir NIGEL KINGSCOTE, seconded by Sir JOHN THOROLD, this resolution was unanimously adopted by the Council, and it was arranged that a copy of it should be communicated to the Home Secretary.

Stock Prizes.

Mr. SANDAY (Chairman) reported that a considerable number of letters relating to Regulation 31, as to classes in which entries from less than three exhibitors had been received, had been laid before the Committee. Instructions had been given for letters to be addressed to the secretaries of the Breed Societies in cases where classes had not filled, informing them of the fact.

Mr. CORNWALLIS, Mr. SANDAY, and Mr. CRUTCHLEY took part in a short discussion as to the operation of this rule.

Judges Selection.

Mr. SANDAY (Chairman) reported the completion of the list of Judges for the Show to be held next June, with the exception of draught horses, harness horses, four-in-hand teams, and jumping competitions, the Judges for which would be settled at a later date.

Implement.

Mr. FRANKISH (Chairman) reported that various slight alterations in the plan of the implement yard for this year's Show had been approved. The Committee recommended the appointment of a Sub-committee, consisting of the Chairman (Mr. Frankish), Mr. Neville Grenville, Mr. Ransome, Mr. Cornwallis, Mr. Marshall, and Mr. Crutchley, to inquire whether any changes might with advantage be made in the classes and structure of shedding in the showyard, and in the classification of exhibits.

General Show.

Mr. CRUTCHLEY reported that, by permission of the authorities, a Military Display would be held on the last day of the Show, Saturday,

June 25, and that sailors, soldiers, and policemen in uniform would be admitted free on that day. The musical performances throughout the Show week would be given by the band of the Royal Horse Guards.

Showyard Works.

Mr. CRUTCHLEY (Chairman) reported the progress made with the erection of the sheds and buildings in the showyard, and presented the Committee's recommendations with reference to a private luncheon enclosure and the admission of Members' carriages to the showyard.

Selection.

Sir JOHN THOROLD (Chairman) reported the receipt of a letter from Mr. H. J. Lovink, Director-General of Agriculture at The Hague, accepting nomination as an Honorary Member of the Society. The Committee recommended the appointment of the Marquis of Granby as Steward of the Forestry Exhibition.

Presidency for the Year 1904-1905.

Sir JOHN THOROLD moved that the name of Lord Middleton be suggested to the General Meeting for election as President of the Society during the year 1904-1905. Lord Middleton had already served as President of some of the large Breeders' Associations, and he was sure that they could not have a better man for the post.

Sir NIGEL KINGSCOTE seconded the motion, and it was carried unanimously.

Lord MIDDLETON, in reply, said that if he could be of any help to the Society he would be glad to have his name suggested to the General Meeting as President for the ensuing year.

Education.

Lord MORETON (Chairman) reported the completion of the arrangements for the holding at Leeds, from the 9th to the 12th

instant, of the Fifth Annual Examination for the National Diploma in Agriculture.

On the motion of Lord MORETON, seconded by Mr. ASHWORTH, the Earl of Coventry was re-elected as the Society's Representative Governor upon the Hanley Castle Grammar School Foundation.

Retiring Members of the Council.

The SECRETARY submitted, in compliance with Bye-law 23c, the list of the twenty-one Members of Council retiring by rotation, and eligible for re-election at the General Meeting to be held on Monday, the 30th instant, and reported that nine other candidates (for names, see page 224) had been nominated for election as Members of Council under Bye-law 23c.

Queen Victoria Gifts Fund.

Sir WALTER GILBEY announced that the Trustees of the "Queen Victoria Gifts" Fund had decided to make a grant to the Royal Agricultural Benevolent Institution of 150*l.* for the year 1904, to be distributed as fifteen grants of 10*l.* each to the five male candidates, five married couples, and five female candidates, who polled the largest number of votes in their class, and who would not this year receive grants from any other fund in connection with the Royal Agricultural Benevolent Institution.

Life Compositions.

The SECRETARY laid upon the table a Report received from the Society's Auditors on the questions relating to Life Compositions referred to them by the resolution of Council dated December 9, 1903 (see pp. xvii-xix). The thanks of the Council were ordered to be sent to the Auditors for this Report, which was referred to the Finance Committee for consideration.

Proceedings at the Sixty-fifth Anniversary Meeting of Governors and Members,

HELD AT THE SOCIETY'S HOUSE, 13 HANOVER SQUARE, LONDON, W.

MONDAY, MAY 30, 1904.

THE EARL OF DERBY, K.G. (PRESIDENT), IN THE CHAIR.

The Sixty-Fifth Anniversary General Meeting of Governors and Members was, in order to comply with Clause 6 of the Charter, held, *pro formâ*, at 13 Hanover Square, on May 23, 1904 (Whit Monday), Sir Walter Gilbey, Bart., in the Chair, but was immediately adjourned until noon on the following Monday, May 30, 1904, when it was held at the Society's house, 13 Hanover Square, W., the Earl of Derby, K.G., President, in the Chair.

Present :

Trustees.—The Earl of Coventry, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingseote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. Victor C. W. Cavendish, M.P., the Right Hon. Henry Chaplin, M.P., the Earl of Jersey, G.C.B., G.C.M.G., Lord Moreton, the Hon. C. T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Mr. Alfred Ashworth, Mr. J. Bowen-Jones, Mr. F. S. W. Cornwallis, Mr. Percy Crutehley, Mr. S. P. Foster, Mr. W. Frankish, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Mr. John Howard Howard, Captain W. S. B. Levett, Lord Middleton, Mr. Alfred Pell, Mr. W. A. Prout, Mr. F. Reynard, Mr. H. P. Ryland, Mr. E. W. Shackle, Mr. A. J. Smith, Lord Wenlock, G.C.S.I., Mr. E. V. V. Wheeler, Mr. C. W. Wilson.

Governors.—Lord Barnard, Sir James Blyth, Bart., Sir Gilbert Greenall, Bart., Captain W. H. O. Duncombe, Mr. G. Norris Midwood, the Rev. D. B. Montefiore.

Honorary Member.—Professor J. McFadyean.

Members.—Lord Balearres, M.P., Sir A. W. Legard, Bart., Surgeon-General Sir Annesley C. C. De Renzy,

K.C.B., Messrs. G. T. Barham, John Barker, R. S. Barrow, W. J. Bennison, C. Bogler, W. Boyer, Roland Burke, Martin Burls, Charles Burrell, jun., Major-General Apsley Cherry-Garrard, Messrs. James S. Cooper, Walter Crosland, Alexander Dickson, Roderick Dow, George H. Evans, Arthur E. Farrar, Moreton Forster, W. H. Foster, W. I. Gee, H. W. Gilbey, Newman Gilbey, W. Crosbie Gilbey, A. G. Gold, Charles Gold, Walter Graham, Gibbons Grinling, Henry Grinling, H. Claude Hay, Colonel E. N. Henriques, R.A., Messrs. D. T. Hine, W. B. Hopkins, W. Hucks, John Hughes, J. Sutcliffe-Hurdall, R. H. P. Hutchinson, Surgeon-Major G. A. Hutton, Surgeon Lt.-Colonel J. Ince, M.D., Messrs. W. J. Jarratt, W. H. P. Jenkins, Major-General R. Owen Jones, C.B., Messrs. John W. Kenworthy, Samuel Kidner, F. A. Cavendish Macdonnell, Douglas Mannington, Ernest Mathews, T. D. Melbourne, Christopher Middleton, Edward Mucklow, jun., John Neilson, Richard Norris, Captain W. E. F. O'Brien, Messrs. S. W. Page, Ralph Palmer, Professor John Penberthy, Messrs. A. W. Perkin, J. T. Pickering, George H. C. Powell, Guy G. Repton, G. T. Ricardo, Leonard Routledge, J. Redman Ryan, E. Sayers, Sidney Sharp, G. F. Sheppard, Frank Silvester, H. M. Simmons, Dr. Bruno Skalweit, Messrs. Henry Smith, Thomas Stirton, J. Herbert Taylor, C. W. Tindall, Edward Trimen, James G. Unite, A. E. Villar, Henry A. Wakeman, Joseph Way, J. R. Whittle, T. P. Wilkes, Thomas Wood, &c.

The SECRETARY having read the Bye-laws governing the procedure at the anniversary general meetings, the first business was proceeded with, viz., the election of the President for the year 1904-1905.

Election of President for 1904-1905.

Lord BARNARD moved that Lord Middleton be elected President of the Society for the year following the Show of 1904. It was not necessary for him to say anything to recommend Lord Middleton to their notice. His Lordship's deep interest in everything which was connected with agriculture and the rearing of stock was well-known to all agriculturists, and he was quite sure that the Royal Agricultural Society would prosper under Lord Middleton's presidency. (Hear, hear.)

Mr. C. W. TINDALL seconded, and the motion was carried unanimously.

Lord MIDDLETON, in reply, thanked the meeting for the kind and cordial way in which they had elected him to be President of the Society for the ensuing year. He had for many years taken great interest in the Society's affairs, but he had only served a short apprenticeship on the Council. Just now was, of course, an anxious time for all of them; but the well-being of the Society would be his chief and earnest desire, and he would endeavour to do all he could to carry out the work expected of him as President of the Royal Agricultural Society for the ensuing year.

Election of Trustees, Vice-Presidents and Council.

The twelve Trustees and twelve Vice-Presidents were re-elected by show of hands. The meeting then proceeded to the election of twenty-five Members of Council under the procedure laid down by Bye-law 23.

The PRESIDENT said that there were thirty candidates for the twenty-five seats on the Council, viz., twenty-one retiring Members of Council, and nine new candidates. One of these retiring Members, Mr. Martin Sutton, had since tendered his resignation, much to their regret, and had intimated that he did not desire re-election. His name had been omitted, therefore, from the voting paper as printed for the use of the meeting.

In accordance with the provisions of Bye-law 23 (c), his lordship proceeded to nominate Mr. Roland Burke, Mr. Ernest Mathews, and Mr. J. Herbert Taylor to act as scrutineers of the voting papers. These having

been duly collected, and the report of the scrutineers thereon received, the PRESIDENT announced that the following twenty-five Governors or Members had obtained the majority of votes, and had therefore been elected Members of the Council:—

FRANKISH, William, The Moorlands, Brucebridge, Lincoln.
 HORNSBY, James, Laxton Park, Stamford.
 LEVETT, Captain W. S. B., Milford Hall, Stafford.
 MARSHALL, Henry D., Carr House, Gainsborough.
 RANSOME, James E., Holme Wood, Ipswich.
 ROGERS, Charles Coltman, Stanage Park, Brampton Bryan.
 CURTIS-HAYWARD, Lieut.-Colonel J. F., Quedgeley, Gloucester.
 FOSTER, S. P., Killhow, Carlisle.
 GRENVILLE, Robert Neville, Butleigh Court, Glastonbury.
 HOBBS, Robert W., Kelmscott, Lechlade, Glos.
 HOWARD, John Howard, St. Mary's House, Bedford.
 RYLAND, Howard P., Moxhull Park, Erdington.
 SCOBY, William, Hobground House, Sinnington, R.S.O., Yorks.
 STRATTON, Richard, The Duffryn, Newport, Mon.
 WARREN, Reginald Augustus, Preston Place, Worthing.
 WHEELER, E. Vincent V., Newnham Court, Tenbury.
 BROUGHAM AND VAUX, Lord, Brougham Hall, Penrith.
 GRANBY, Marquis of, Belvoir Castle, Grantham.
 GREENALL, Sir Gilbert, Bart., Walton Hall, Warrington.
 MUNTZ, Sir Philip Albert, Bart., M.P., Dunsmore, Rugby.
 WILLIAMS, J. C., Caerhays Castle, St. Austell.
 MIDDLETON, Christopher, Vane Terrace, Darlington.
 KNOWLES, Robert Millington, Colston Bissett Hall, Notts.
 MONTEFIORE, The Rev. D. B., Mursley Hall, Winslow.
 PALMER, Ralph, Hubbards, Nazeing, Essex.

Report of Council.

The SECRETARY, having briefly indicated the principal items in the Report of the Council, it was adopted on the motion of Mr. WALTER CROSLAND, seconded by Mr. JOHN BARKER.

Suggestions of Governors and Members.

In response to the usual inquiry from the Chair as to whether any Governor or Member had any remark to make or suggestion to offer that might be referred to the Council for consideration,

Mr. H. M. SIMMONS inquired if, in reference to the balance-sheet, he was right in assuming that there had been a loss of 3,000*l.* on the ordinary expenditure.

The PRESIDENT explained that the accounts had been stated under the advice of the Auditors, and it had been considered desirable to place before the Society the figures as plainly as they possibly could. The Council had thought it their duty to let the Members know exactly the position in which the Society stood, and there was no endeavour to hide or conceal anything. He (the President) would frankly confess, on behalf of himself and his colleagues, that the position was one not altogether free from anxiety. No great change, however, such as that which the Society had undergone and which they were now carrying out could be made without initial difficulties. It would be within the recollection of every one that the circumstances of last year were not such as enabled them to take full advantage of the ground which they had acquired, and very much would depend upon the Show of this present year. But they were, it was believed, better equipped, and knew better how to deal with the work of the Show of 1904 than could possibly be the case last year. He would be glad to afford information on any particular point which might be indicated by any Member present, as far as he possibly could; but he thought he could best save the time of Members by saying that their accounts had been most carefully gone through by the Society's Auditors, and had been stated in accordance with commercial practice; so that the Council and their Members could see exactly how the affairs of the Society stood. The Sub-committee on Finance that had been appointed had made certain recommendations, which had been laid before the Council. These recommendations had been referred to Committees, who were considering how the reductions could best be carried out. The Finance Committee were doing their utmost to reduce the Society's expenditure, and would only recommend expenditure that was absolutely

necessary in connection with the work of the Society.

Mr. SIMMONS said that he was of the opinion that the time had now arrived to reconstruct the Society, with the view of reducing expenses.

Surgeon Lt.-Col. INCE suggested that the subscription of Members of the Society be raised from 1*l.* to 1*l.* 1*s.* per annum.

Vote of Thanks to Chairman.

No other member rising, the Right Hon. HENRY CHAPLIN, M.P., proposed a vote of thanks to the President for his services in the Chair. (Cheers.) It had been a year in which the Society had had to encounter difficulties of no ordinary character. The noble President himself had made the observation that the position of the Society at the present moment was one which was by no means free from anxiety, and that much would depend upon the success or otherwise of the Show to be held next month. Under these circumstances, they all of them owed the President—and, indeed, any President who might be in the Chair at such a time—the best thanks that they could give him for the services which he had rendered to the Society.

Surgeon-Major HUTTON, in seconding the resolution, observed that he would like to see 20,000 Members of the Society instead of 10,000; and if every member could get another to join it, they would soon arrive at this result.

The motion having been put by the SECRETARY was carried unanimously.

The PRESIDENT, in reply, said he felt very deeply the kindness with which they had received the vote of thanks to him for such services as he had been able to render to the Society during the past year. He need hardly tell any one present in that room that he felt it doubly at a moment like the present, when in the exercise of their duty they had a situation not free from anxiety. It was only through the President feeling that he was supported by the Members that the work of the Society could be carried out in the spirit that it always had been—that is, by mutual self-reliance. He did not wish to take up any time

or raise any discussion, but the Council would recollect that they were just beyond the parting of the two ways. It would be remembered that there had been repeated discussions with regard to the change of practice in the holding of the Society's Shows. There were increasing difficulties in getting the accommodation required, and in getting funds for the purposes of the Society's Shows. During the period in which the Society had held its Shows in different localities, all this had brought about heavy expenditure upon the Society, and they had decided, not without deliberation, and not without much discussion, to establish themselves upon a permanent ground. For his own part, he had the same belief in a permanent showyard as when they

first started. The Society had in its new ground acquired, under very favourable terms, a property which might prove of great value. If the Society should eventually go back to a former state of affairs, at all events there would be something to set upon the other side. He hoped that when his successor came to lay down his office he would be able to give an account of the Society's affairs more favourable, and to say that things were beginning to work out more happily. The Society had taken a bold decision, and, he believed, a right one, and was going forward, under altered and improved circumstances, in the same spirit that it had shown for the last sixty years or more.

The proceedings then terminated.

Proceedings of the Council.

WEDNESDAY, JUNE 1, 1904.

THE EARL OF DERBY, K.G. (PRESIDENT), IN THE CHAIR.

Present:

Trustees.—The Earl of Coventry, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Earl Spencer, K.G., Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. Victor C. W. Cavendish, M.P., the Earl of Jersey, G.C.B., Lord Moreton, the Hon. Cecil T. Parker, Sir Jacob Wilson.

Other Members of Council.—Mr. Alfred Ashworth, Mr. R. C. Assheton, Viscount Baring, Lord Brougham and Vaux, Mr. Percy Crutehley, Lt.-Col. J. F. Curtis-Hayward, the Hon. A. E. Fellowes, M.P., Mr. S. P. Foster, Mr. W. Frankish, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Captain W. S. B. Levett, Mr. Henry D. Marshall, Mr. Joseph Martin, Lord Middleton, Mr. T. H. Miller, Mr. Albert Pell, Mr. W. A. Prout, Mr. F. Reynard, Mr. Howard P. Ryland, Mr. E. W. Shackle, Mr. Garrett Taylor, Mr. C. W. Wilson.

Election of New Members.

The Minutes of the last meeting of the Council, held on May 4, 1904,

having been taken as read and approved, the election of eighty-nine new Members was proceeded with.

The Reports of the various standing Committees were then presented and adopted as below:—

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the month of May, 1904, showed total receipts amounting to 1,106*l.* 4*s.* 9*d.*, and expenditure to 1,255*l.* 14*s.* 1*d.* Accounts amounting in all to 5,104*l.* 7*s.* 2*d.* had been passed. The Committee had had under consideration the recommendations of the Sub-Committee on Finance, together with the Report of the Auditors on the question of Life Compositions, and some valuable suggestions on the subject of Membership. They proposed further to consider all these matters together after the forthcoming Show; but meanwhile they thought it desirable that formal notice should be given of an alteration in the present Bye-laws so as to enable the question of Life Membership to be discussed by the

Council. The Committee suggested that Sir Walter Gilbey's motion, which appeared on the agenda paper for November 4, 1903, and which was temporarily withdrawn by him, would meet the case if Sir Walter should be willing again to give notice of such a motion.

Sir WALTER GILBEY then gave formal notice that at the meeting of the Council to be held on July 27 he would move the adoption of the following new Bye-law:—

7A. The provisions relating to Life Compositions contained in Bye-laws 5, 6, 6A, and 7, shall not apply to any candidate admitted into the Society after the year 1904. On and after January 1, 1905, the condition of admission or re-admission of any person into the Society shall be the signing by the candidate of an undertaking to pay, until the termination of the year in which he shall withdraw from the Society by notice in writing to the Secretary, a minimum annual subscription of 1*l.* to the Society's funds.

He did not think any remarks were needed from him on this question, in which he had been interested for a number of years. He was of opinion that if this motion were placed upon the agenda paper for the meeting of the Council on July 27 next, a discussion of the question would result in advantage to the Society.

House.

Sir NIGEL KINGSCOTE (Chairman) reported that various accounts relating to house expenses had been passed and referred to the Finance Committee for payment. The Committee had had for some time under their consideration the possibility of letting certain of the rooms in the Society's House, and they were making inquiries with this object.

Journal.

Sir JOHN THOROLD (Chairman) reported the issue of two new pamphlets on Fruit and Vegetable Farming, written for the Society by Mr. Charles Whitehead and Mr. James Udale respectively, and published by Mr. Murray at 1*s.* each. The thanks of the Society were due to Mr. Charles Whitehead as the author of the pamphlet on Fruit Farming. Preliminary consideration had been given to the recommendations of the Sub-committee on Finance, as relating to the

Society's Journal; and the possibility of effecting economies in various directions had been discussed.

Chemical and Woburn.

Mr. REYNARD reported the recommendation of the Committee that formal invitations should be addressed to the President of the Board of Agriculture and the members of the Lawes Agricultural Trust Committee, to join in the annual visit of inspection by Members of Council to the Society's Woburn Experimental Station on Wednesday, July 6 next. The Committee had had under their consideration the recommendations of the Sub-committee on Finance, but, feeling the necessity of having fuller information, they had deferred the matter for further discussion. The opportunity of the annual visit of inspection would be utilised for considering whether any modification could be made in the arrangements for the field and feeding experiments carried on at the farm, and for the pot-culture experiments, for the latter of which the income arising from the Hills' Bequest was insufficient, and needed to be supplemented by the Society.

The Committee had considered a Report by Dr. Voelcker of a case referring to a purchase of white lead, and they recommended the publication of this Report as follows:—

Report of Consulting Chemist.

"WHITE LEAD."

"White lead," as used for paint and for estate work generally, is understood as being a basic carbonate of lead, and is mostly prepared by the old, or "Dutch," process.

Of late years other processes have been introduced, and also other salts of lead, *e.g.*, the sulphate, have been suggested to take the place of white lead. Though these vary, none of them possess to the full the "covering" power which genuine white lead has, and they are sold at a lower price.

These substitutes ought not, however, to be described as "white lead," and the following case, which lately occurred, may be useful in warning land and estate agents to be careful as to what they buy when asking for "white lead."

The agent of a nobleman in the home counties sent to Dr. Voelcker in April last a sample of what had been guaranteed as "pure white lead," and which was to be used for estate purposes. On analysis, it was found not to be white lead as properly described, but, instead

of being the *carbonate* of lead, it was *sulphate* of lead. It was purchased and described as "genuine English white lead in oil," the price being 18*l.* 9*s.* per ton, less 2½ per cent. for cash. The price of genuine white lead (in oil) was at the time 22*l.* per ton, less 5 per cent. for cash.

The sulphate of lead was found to have good covering power, though not equal to that of ordinary good white lead. It is not, however, right that when "white lead" is ordered a material different from it should be sold under that name, or covered by the prefix "English." The vendors, on being written to, admitted the correctness of the report, and took the delivery back.

J. AUGUSTUS VOELCKER.

May 31, 1904.

On the motion of Mr. REYNARD, seconded by LORD MORETON, Sir John Thorold was re-elected as the Society's representative upon the Committee of the Lawes Agricultural Trust for a further period of five years ending June 5, 1909.

Botanical and Zoological.

Mr. REYNARD reported that the Consulting Botanist had dealt with 56 inquiries since the last meeting. The Zoologist had reported that the question of the value to agriculture of rooks had again arisen. These birds during most of the year were extremely useful on account of their wholesale destruction of wireworm and other insects, but they also did occasional harm to corn crops and to young turnip plants, which they rooted out in their search for the grub. For this reason it was recommended that rooks should be kept from the turnip crop for some time after the roots had been singled out.

Veterinary.

The HON. CECIL PARKER (Chairman) reported that forty-five entries had been received for the Horse-Shoeing Competition in Class I. (hunters), and fifty-two in Class II. (cart horses). The Committee recommended that Professor Macqueen's lecture on "The Horse's Foot, and How to Shoe it," be fixed for Thursday, June 23.

Stock Prizes.

Lord MIDDLETON reported the Committee's recommendation that the dates of closing the entries for draught horses (Classes 22 and 23), harness horses and ponies, four-in-hand teams, and trotting horses (Classes 55 to 63),

be extended to 5 p.m. on the day before the various classes competed in the showyard.

Implement.

Mr. FRANKISH reported that the Committee proposed to consider during the Show the question of the storage of the Society's engineering plant. Various details relating to the Show had been laid before the Committee, and instructions given thereon. The "new implements" entered for the Society's Silver Medals numbered sixty-eight.

General Show.

The Earl of JERSEY (Chairman) brought up for adoption the programme of the forthcoming Show at Park Royal, Willesden, as finally settled, and it was arranged that all departments of the Show should open on Tuesday the 21st instant, when the judging of live stock, poultry, and produce would take place and when the charge for admission would be 5*s.* Upon Wednesday and Thursday, the 22nd and 23rd instant, the charge for admission would be 2*s.* 6*d.* from 9 a.m. to 4 p.m., and 1*s.* from 4 p.m. to 8 p.m. On Friday and Saturday, the 24th and 25th instant, the admission would be 1*s.*

The Committee reported that the principal railway companies had agreed to issue tickets to Members of the Society visiting the Show from stations not less than thirty miles from London at the rate of a single fare and a quarter for the double journey, on presentation of a voucher to be obtained from the Secretary.

Showyard Works.

Mr. CRUTCHLEY reported that the implement yard had been completed, and that the fittings required by exhibitors to their stands were in hand. Arrangements had been made for the distribution of copies of a map of the routes to the showyard amongst the clubs and hotels in London.

Selection.

Sir JOHN THOROLD (Chairman) reported the result of the election of twenty-five Members of Council at the General Meeting held on the 30th May. The Committee recommended that each of the five new

Members of Council whose period of office would not, under the Charter, commence until after the Show, be invited to accept the privileges of Members of the Council at the Show, and to attend the special meetings in the showyard.

Resignation of a Member of Council.

The SECRETARY read a letter, dated May 6, 1904, received from Mr. Martin J. Sutton, formally resigning the seat on the Council which he had held since 1883.

The PRESIDENT said that a similar letter had also been addressed to him as President of the Society. He was sure that they would all feel the same regret that he himself felt, that Mr. Sutton had deemed it necessary to sever his connection with their body. He (the President) felt that though there might be differences of opinion on vital points, public men might go apart without any breach of private friendships, and possibly in the hope of being re-united. Meanwhile, the Council would always remember the very valuable services which Mr.

Sutton had rendered to the Society as a Member of the Council.

Education.

Lord MORETON (Chairman) reported that the Fifth Examination for the National Diploma in Agriculture had been held by the National Agricultural Examination Board at the Yorkshire College, Leeds, from May 9 to 12, when seventy-two out of seventy-five candidates who entered presented themselves. As the result of the examination, thirty-five candidates had passed in Part I., thus qualifying to sit for Part II. in either 1905 or 1906; and twenty candidates who had previously passed Part I. had succeeded in passing Part II., and would, therefore, receive the National Diploma in Agriculture.

Dairy.

Mr. ASHWORTH reported the completion of the arrangements for the Butter-making Competitions at the Show. The number of competitors in each class was as follows:—Class I., 22; Class II., 14; Class III., 31.

Proceedings at General Meeting of Governors and Members,

HELD IN THE LARGE TENT IN THE SHOWYARD AT

PARK ROYAL.

WEDNESDAY, JUNE 22, 1904.

THE EARL OF DERBY, K.G. (PRESIDENT), IN THE CHAIR.

Present on the Platform.

Trustees.—Earl Cawdor, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., the Earl of Faversham, the Earl of Jersey, G.C.B., Lord Moreton, the Hon. Cecil T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Viscount Baring, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutehley, Lt.-Col. J. F. Curtis-Hayward, Mr.

Alfred Darby, Mr. J. Marshall Dugdale, Mr. W. Frankish, Mr. R. M. Greaves, Mr. W. Harrison, Mr. John Howard Howard, Mr. R. Millington Knowles, Mr. Joseph Martin, Lord Middleton, Mr. T. Horrocks Miller, Sir P. Albert Muntz, Bart., M.P., Mr. Ralph Palmer, Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. H. P. Ryland, Mr. W. Seoby, Mr. E. W. Stanyforth, Mr. R. Stratton, Mr. J. P. Terry, Mr. C. W. Wilson.

Honorary Members.—The Right Hon. Sir Horace C. Plunkett, K.C.B., F.R.S., Sir Thomas H. Elliott, K.C.B., Mr. James Macdonald, F.R.S.E.

Others present included the Earl of Onslow (Governor), Sir John Heron-Maxwell, Bart., Sir Oswald Mosley, Bart.; and there was a large attendance of the general body of Members.

THE PRESIDENT, in opening the proceedings, said that the meeting was held annually, under the Charter, and it was customary to hold it in the showyard. He did not know that there was very much to be brought before the meeting, and the circumstances under which they now met in their own showyard obviated the necessity for some of the resolutions which used to be proposed. They had now become rather more established—as he hoped most of them had recognised—upon the ground which they had acquired, and of which they took possession last year. Of the state of things last year perhaps the least said the better, except that they might contrast it favourably. He hoped that would be their verdict. They would see that the ground was in gradual process of being more organised. They had tried to bring the extensive exhibits more together. They had improved the roads, and year by year they trusted that they should learn by experience to make still better arrangements, and to make this great Show all that it ought to be. (Hear, hear.) They must not judge of the attendance altogether by the numbers apparently present, as it was obvious that a large showyard like the present would appear to be more sparsely attended than a smaller showyard with the same number of people. Any new undertaking would inevitably require a certain time to make the general public acquainted with it, and to let people find out that it was not a thousand miles from the Metropolis to the Show, while they also hoped that the various conveniences afforded by the railway companies for transit would be improved from year to year. They had met in the best of weather instead of the worst. At their last Show they were in a transitional state.

He now ventured, as the President about to lay down his office, still to cherish the hopes he had expressed before as to the future of their Show. Of course if people wilfully held back from the Show there was no reasoning

with such; but they should bear in mind the greater proposition and not the less—not the success of any one Show, but the success of the Royal Agricultural Society. He hoped, therefore, that they would stand shoulder to shoulder and back them up. (Cheers.) Some people appeared to think that they were mean enough to have feelings of jealousy of the large societies in the counties and districts of counties—such as the Bath and West, the large Northern shows, the Royal Counties, and so forth. On the contrary, they welcomed their efforts, and only hoped that they might be the central pivot around which those large and important bodies might revolve, and that they might help the Society as the Society was determined to help them in discharging the duties imposed upon them. In leaving the Chair he thanked the Council and the Members for the willing support they had uniformly given, not to him personally, but as President of the Society. He hoped that his successor might rely upon as cordial assistance from the Secretary, from the staff, and from the Members and others connected with the Society as had been extended to himself, and for which he now returned his grateful thanks.

Vote of thanks to the President.

The Earl of ONSLOW then moved, "That the best thanks of the Society are due and are hereby tendered to the Earl of Derby, K.G., for his services as President during the past year." He said there was an old English saying that "What Lancashire thought to-day England would think to-morrow." They were well advised in the early days of their great change to select as their President a man from Lancashire. He had a difficult task in following as their President H.R.H. the Prince of Wales. His Royal Highness and His Majesty the King had always evinced the greatest interest in the Society, and it was a matter of regret that the numerous engagements which crowded round His Majesty, and which were fraught with the deepest interest not only to England, but to foreign lands as well, had prevented him this year from following his annual practice of being

present at this Show. He was sure that every Member of the Society echoed Lord Derby's wish that the success of the Show might increase year by year. He knew well that in the old days every farmer liked to come up for Smithfield week, and more than that every countryman in London liked to go to Smithfield to smell again the fresh odour of the cow byre. (Laughter.) He certainly hoped that those many millions who flocked from the country districts to the Metropolis would not forget that within easy reach of London was annually to be found in far pleasanter circumstances and better weather than they could ever get in winter an exhibition that would gradually come to be recognised as one of the great institutions of the London season. He asked them to record a hearty vote of thanks to Lord Derby for his great kindness in undertaking the Presidency of the Society, and to join in congratulating him upon the successful work which he had done in their interests.

SIR JOHN HERON-MAXWELL seconded the resolution, which was then put by the SECRETARY and carried unanimously.

THE PRESIDENT, in reply, thanked Lord Onslow and Sir John Heron-Maxwell for their kind words, and the meeting for the cordial way in which they had received them. The presence of Lord Onslow was an indication of the interest which the Board of Agriculture took in their Show, as well as of his lordship's wish to cultivate the acquaintance of those who practised agriculture. He should always treasure the recollection of his year of office as President, although it had not been an unchequered one, and he would keep a lively recollection of those kind friends and acquaintances whom they had made in connection with the great agricultural pursuits that so deeply interested them all.

Vote of thanks to the Railway Companies.

SIR JACOB WILSON said it had fallen to him to propose the next resolution, and he undertook the duty with unqualified pleasure and satisfaction. It was that the best thanks of the Society are due to the various railway companies for the facilities accorded by

them in connection with the Show, and especially for the advantages given to the country Members in their railway journeys to and from the Show. He said that age had its responsibilities as well as its privileges, for it was now more than thirty years since he commenced to take a somewhat active part in the administration of the Royal Showyard, and during that time he had had ample, and perhaps exceptional, opportunities of observing the very efficient manner in which the Society and its Members had been served by the railway companies. The casual visitor found everything in apple-pie order, and did not stop to inquire how this had been brought about. An inquiring mind would be able to tell him that from the moment when the showyard was but a bare piece of ground, every stick that had been used to erect the sheds had been brought by the railway companies. When the sheds had been erected—in what he hoped they would admit was a substantial and efficient manner—they had then to be filled by the exhibits of heavy machinery and by animals brought by the railway companies from all parts of the country. When all these were ready thousands of visitors from all parts of the country had to be brought by rail both by day and night. With regard to the Show at Park Royal, he would remind them that three of the principal railways had thought it worth their while to extend their lines up to the Showyard, and to make special sidings for the accommodation of the public wishing to come to the Show. This year the companies had shown a very special interest in the work of the Society by offering their Members the most liberal privilege of travelling at the rate of a single fare and a quarter for the return journey. The Members had not been slow in their appreciation of that boon. He hoped that the Members would support him in passing this resolution, and show how thoroughly they appreciated the privileges conferred by the railway companies.

MR. PERCY CRUTCHLEY seconded the resolution, and said that he had, as Honorary Director, exceptional opportunities of realising the work which the companies had done.

The **PRESIDENT** then put the resolution, and it was carried unanimously.

Suggestions of Governors and Members.

In response to the usual inquiry from the Chair as to whether any Governor or Member had any remark to make or suggestions to offer for the consideration of the Council,

Mr. **SAMUEL KIDNER** expressed his pleasure at the hopeful view which the President took of the future of the Society. He was sure that all the Members had the same feeling and were willing, so far as they could, to make this enterprise successful. They all felt that they must have a Royal Show, and with the influence around them, they felt certain as Englishmen that they would make it a success. As a small struggling tenant-farmer, he hoped that certain small economies would not be persisted in. He felt it a privilege to be able to show in the same class with the King and the nobility of this country, but he felt that the course pursued by the Council would have the effect of driving them out for the sake of a few pounds. There was a pound entrance fee, for instance, and exhibitors were obliged to send a man for every two exhibits, which was often unnecessary. If the classes were not represented, they would lose the custom of the foreigners in the showyard. If the Royal Agricultural Show was to remain as such, every class of stock in this country should be found there, and it should be the duty of the Council to help struggling tenant-farmers, rather than to put a damper upon them by sending them back with their exhibits.

Mr. **ANDREW PETERSON**, a Member of the Society, aged ninety, said that as an old lawyer he preferred to be in the position of the mortgagee rather than in that of mortgagor. He noticed that the Society had a mortgage upon the showyard, and whilst this was so he felt that the Society could not give proper effect to its real objects. He suggested that every Member should contribute to a special fund for the purpose of paying off this mortgage, and said that if every Member would do so a considerable proportion of the mortgage would be

wiped off. He was not able to give a great sum himself, but would give 10*l.* annually whilst he lived. He referred to the earthworm rescarches of his old school-fellow, Charles Darwin, and to the importance of the Society being in a position to devote attention to experiments bearing upon the food of the people.

President for 1904-1905.

Mr. **A. BUCK**, in moving that Lord Middleton do take the Chair as President after the conclusion of the present Show, said he had been a Member for fifty-two years, and he hoped to live long enough to see the Society firmly established, and to continue to do the good in the future that it had done in the past.

Mr. **GEORGE GIBBONS** seconded the resolution, recalling the fact that the first Show he attended was in 1842. There had been a considerable advance in the Society since that time, and the fact that English cattle, English implements, and English products were so pre-eminent throughout the world had been largely due to the Royal Agricultural Society. He was at the Show of 1888, when held in Lord Middleton's park at Wollaton, and he hoped that his year of office would be as successful as was the Show on that occasion.

The motion having been carried, Lord **MIDDLETON**, in acknowledging it, said he took up the reins of office with some anxiety, looking as he did at the long list of distinguished Presidents before him—distinguished not only in agriculture, but in many lines of life. They were all agreed that there was a great improvement in the showyard since last year. Their thanks were due to the Council and to those of the officials who had been instrumental in effecting this. One thing more was wanted, and that was the attendance of the public during the rest of the Show. It might not be out of place for him, as the in-coming President, to ask the citizens of London to give their attendance and support during this week, and thus to acknowledge the great link between town and country, and their mutual dependence upon one another.

The proceedings then terminated.

Proceedings of the Council.

WEDNESDAY, JULY 27, 1904.

LORD MIDDLETON (PRESIDENT), IN THE CHAIR.

Present :

Trustees.—Earl Cawdor, the Earl of Derby, K.G., Earl Egerton of Tatton, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., Mr. Victor C. W. Cavendish, M.P., the Earl of Feversham, Lord Moreton, Mr. G. H. Sanday.

Other Members of Council.—Viscount Baring, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, Mr. W. Frankish, the Marquis of Granby, Mr. R. M. Greaves, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Mr. J. Howard Howard, Mr. R. M. Knowles, Mr. Henry D. Marshall, Mr. Christopher Middleton, Mr. T. H. Miller, the Rev. D. B. Montefiore, Mr. Ralph Palmer, Mr. J. E. Ransome, Mr. F. Reynard, Mr. Howard P. Ryland, Mr. E. W. Shackle, Mr. A. J. Smith, Mr. R. Stratton, Mr. Garrett Taylor, Lord Wenlock, G.C.S.I., Mr. E. V. V. Wheeler.

Minutes of Previous Meetings.

The minutes of the last monthly meeting of the Council, held at 13 Hanover Square, on June 1, 1904, and the minutes of the Special Council Meetings, held in the Showyard at Park Royal, on June 21, 23, 24, and 25, were taken as read and approved.

(The minutes of the Special Council Meetings related chiefly to matters of detail affecting the Show, and to votes of thanks to those who had assisted in various ways in organising it. At the final meeting on June 25, 1904, it was resolved, on the motion of the Hon. CECIL PARKER, seconded by the Marquis of GRANBY, "That the Trustees of the Society be appointed a Committee to consider the present position of the Society, the Committee

to be convened by the incoming President (Lord Middleton) and to have power to add to their number.")

Deaths of Members.

The PRESIDENT, in opening the proceedings, said it was his melancholy duty to report officially from the Chair, the death since the last meeting, of their old friend, General Viscount Bridport. Lord Bridport, as Major Hood, first joined the Society as a Member as long ago as 1842. He became a Member of the Council in 1858, a Governor in 1862, and was President of the Society in 1875, when the Show was held at Taunton. He was a Vice-President from 1864 to 1871, when he was elected a Trustee. At the time of his death, Lord Bridport was the senior of those who filled this position. In his day he took an active part in the work of the Society, and served upon some of its more important Committees, including the Finance Committee, of which he was a member from 1859 to 1902, and Chairman from 1861 to 1875. Although latterly, as was only to be expected from his advanced age, he had not been able to attend their meetings very frequently, his interest in the work of the Society was unabated until the end.

In Professor James Beart Simonds, who reached the great age of ninety-five, the Society had lost its senior Consulting Veterinary Surgeon. More than sixty years ago he was acting as Veterinary Inspector at the Society's earliest Shows. Professor Simonds rendered eminent services to the veterinary profession by his scientific researches and as Principal of the Royal Veterinary College; and their Society in particular was indebted to him for his valuable treatises in the early volumes of the Journal on the anatomy, physiology, and pathology of farm animals, and, later, for his efforts to combat the disastrous outbreak of cattle plague in 1865.

He was sure that it would be the wish of the Council to pay their tribute of respect to the memory of these two distinguished men, who in their respective spheres did so much for the Society and for the cause of agriculture. They had passed to their rest full of years and honour.

Unhappily they had just lost another colleague in Mr. Joseph P. Terry, who died on Sunday last. Mr. Terry, as a member of the Chemical Committee, had rendered valuable practical assistance in the management of the Woburn Experimental Farm, and he had also acted as steward at the Shows. He could himself bear testimony to the value of Mr. Terry's counsel on the Stock Prizes Committee. He joined the Council in 1890, and his loss would be greatly regretted.

Election of New Governors and Members.

The election of two Governors and 163 Members was then proceeded with.

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the period ended July 23, 1904, as certified by the Society's Accountants, showed receipts amounting to 9,234*l.* 12*s.* 10*d.*, and expenditure amounting to 9,075*l.* 0*s.* 2*d.* Accounts amounting in all to 11,709*l.* 3*s.* 2*d.* relating to the recent Show, and to 2,481*l.* 3*s.* 7*d.*, arising out of the ordinary business of the Society, had been passed and were recommended for payment. As to the means to be adopted for paying these accounts, and as to the position of the Society generally, the Trustees of the Society had, as requested by the Council at their meeting held on the last day of the Show (June 25), held several meetings, and had drawn up a statement which, with the authority of the President, had been circulated amongst the Council in anticipation of that meeting. In the recommendations made in the statement the Finance Committee concurred.

On the motion of Earl EGERTON OF TATTON, seconded by the Marquis of GRANBY, it was agreed (with the assent of Sir Nigel Kingscote) that this statement should be regarded as part of the Report of the Finance Committee, they having concurred in

the recommendations made by the Trustees.

In the subsequent discussion on the Report, and matters arising thereon, Viscount BARING, Mr. STRATTON, Earl EGERTON OF TATTON, the Marquis of GRANBY, Sir NIGEL KINGSCOTE, Mr. SANDAY, Mr. WHEELER, Mr. RANSOME, Mr. CHRISTOPHER MIDDLETON, Mr. BOWEN-JONES, Mr. RYLAND, Earl CAWDOR, Sir WALTER GILBEY, Mr. CRUTCHLEY, Mr. HARRISON, and others took part, and eventually the Report was adopted unanimously (as below), and ordered to be circulated.

Report of the Finance Committee.

1. Since the Council last met at Hanover Square on June 1, the situation of the Society has entirely changed. The second Show held at Park Royal has been a very great disappointment, and it is obvious that the whole question of the future of the Society must come under immediate and careful review. The Council are all impressed with the necessity of economy and the curtailment of expenses, whatever may be the decision as to the future. But the particular directions in which these are to be effected must necessarily depend upon what, after collecting the views of exhibitors of implements and stock at the Shows, and of the members of the Society, may be decided as to the spheres of usefulness of the Society after the present year.

2. In accordance with the wish expressed by the Council at their final meeting held in the Showyard at Park Royal on the last day of the Show (June 25), a meeting of the Trustees was held on Wednesday, June 23, "to consider the position of the Society." At this meeting a general discussion took place, and the Trustees decided to call into their counsels certain other members with special experience. A second meeting of the Trustees and of their coadjutors was held on Tuesday, July 5, when a statement was laid upon the table showing approximately the receipts and expenditure of the Show of 1904.

3. It appeared from this statement that, whilst there would probably be a net economy in the expenses of last month's Show of about 5,100*l.*, as compared with the Show of 1903, the receipts from nearly every source (entries of implements, admissions, grand stand, catalogues, &c.) had shown a shrinkage which amounted in all to 4,100*l.* Thus the Show of 1904 would on balance be only 1,000*l.* less costly to the Society than that of 1903, when there was a deficit of 9,680*l.*: so that a loss to the Society of from 8,500*l.* to 9,000*l.* must be anticipated from the holding of the Show of 1904.

4. As the Council will be aware, it had only been possible to finance the loss caused by the previous Show of

1903 by pledging to the Society's bankers the Society's holding of 13,100*l.* in the Harewood House Debenture Stock (its only free asset), on the collateral security of which the bank has advanced to the Society during the last twelve months the sums required for its operations.

5. The heavy loss on the Show of 1904 has imposed upon the Council the necessity of applying to the bank for an extension of time for the repayment of their advance of 1903, and for still further advances of large amount to meet the Society's obligations in the matter of prizes, administration expenses, showyard works, advertising, printing, and other outgoings in connection with the recent Show, as well as for ordinary expenses up to the end of 1904. It is estimated that 10,000*l.* more will be required before the recess, and 5,000*l.* during the coming autumn and winter, to meet the other obligations of 1904. This being so, the Trustees held a third meeting on Friday, July 15, and were fortunate in being able to arrange with six of their number to guarantee to the Bank sums of varying amount which are equal in the aggregate to the total further sum required, 15,000*l.*

6. It will be understood by the Council that these guarantees are temporary only, and are given by the guarantors in order to enable the Council to have time to consider the Society's position, but meanwhile to meet the Society's Show obligations that are customarily discharged at this period of the year, and its ordinary outgoings up to the end of 1904. Such guarantees will be collaterally secured by the deposit with the bankers of the Society's holding of 15,000 shares in Park Royal Limited, and by an undertaking to be given by the Society to execute, if required, a second mortgage of 7,500*l.* on Harewood House, to rank after the existing stock. Unless other means can be found of putting the Society into funds, it will obviously be necessary to realise eventually one or more of these assets, to repay the bank or the guarantors—who will have to engage with the bank to honour their guarantees not later than July 31, 1905, if called upon to do so.

7. With regard to the future, it is obvious that a careful consideration of the whole circumstances of the Society must be given by the Council as soon as may be found possible after the recess, and before any future engagements as to Shows or the like can be entered into. In this connection the following suggestions are submitted:—

SUGGESTIONS.

I. That a careful statement should be drawn up under, as far as possible, the headings of the several Committees of the Council, showing the work of each of the different departments of the Society (including Park Royal Limited), and indicating how much it costs; also stating how far work which the Society once did as pioneer is now duplicated by other organisations. The terms of

such a statement might be settled by a very small Committee, to consist of the President, Sir Nigel Kingscote (representing Finance), Sir John Thorold (representing the Scientific branches of the Society's work), and Mr. Crutchley (as representing the Shows), the Chairman of each of the Standing Committees being taken into consultation as to the references made in such statement to the work of his own Committee.

II. That there should be next October, in the week of the Dairy Show (October 4 to 7):—

(a) A Conference between the Society's Implement Committee and the exhibitors in the Implement Department at the Show of 1904, with a view of endeavouring to ascertain the measure of support which such exhibitors are likely to give to Shows held by the Society in the future. [*Fixed by Council for Wednesday, October 5, at 11 a.m.*]

(b) A Conference between the Society's Stock Prizes Committee, and the exhibitors of live stock in 1904, together with representatives of the various Breed Societies, for the purpose of hearing their views about the Society's Show and prize sheet, and also of ascertaining the amount of financial support in the way of guarantees or otherwise that they would be willing to give to the Show. [*Fixed by Council for Wednesday, October 5, at 2.30 p.m.*]

(c) A meeting of the full Council of the Society to hear the results of the two Conferences above mentioned, and to consider the terms of the statement referred to in Suggestion I. [*Fixed for Thursday, October 6, at 11 a.m.*]

III. That upon such statement, &c., should be based a circular-letter to both Annual Members and Life Members, pointing out the necessity of increased financial support from them, if the Society's operations are to be carried on as at present or even in a modified form, and seeking their views as to such points as:—

(a) A voluntary increase of their own subscriptions.

(b) The abandonment of any of the departments of the Society's work to enable others to be carried on with due efficiency.

(c) The amendment of the Society's Charter so as to provide (*inter alia*) modern methods of election to the Council (which could be done by obtaining a Supplementary Charter repealing Clause 6 and substituting power for a General Meeting to make from time to time Bye-laws as to election to the Council).

(d) Other points that may suggest themselves.

IV. That the answers to this circular should be considered by the Council at their November meeting, and that a Report be based thereon, to be laid before the members at a Special Meeting to be called for the purpose as early as possible in November, when a final

decision would be arrived at as to what should be the nature and extent of the Society's operations for the future, in view of the probable income that it can expect from the promises meanwhile made to it.

MIDDLETON,
President.

13 Hanover Square, London, W.
July 27, 1904.

House.

Sir NIGEL KINGSCOTE (Chairman) reported that the Committee were continuing their inquiries as to the possibility of letting off to some other society or organisation such of the rooms in Harewood House as might not be required for the Society's own purposes.

Journal.

Sir JOHN THOROLD (Chairman) reported that a demand had arisen for the "Conclusions" at the end of Mr. A. D. Hall's article, on "The Manuring of Grass Lands," in the last Volume of the Journal, for distribution by landowners amongst their tenants. The Committee recommended, therefore, that copies of these "Conclusions" be reprinted as a leaflet of two pages. Copies were laid upon the table of the three pamphlets relating to forestry, which were issued in connection with the recent British Forestry Exhibition, viz., (1) "The Management and Planting of British Woodlands," by Professor Charles E. Curtis; (2) "The Conversion of Home-grown Timber," by Robert Anderson; and (3) "Insects Injurious to Forest Trees," by Cecil Warburton. These pamphlets were now available at the rate of 1s. per copy, or 6d. to Members, direct from the Society.

Chemical and Woburn.

Mr. BOWEN-JONES (Chairman) reported that the annual inspection of the Woburn Experimental Farm by the Council had taken place on July 7, and that visits had also been paid to the farm by twenty-three farmers from the surrounding district on July 11, and by fifty-three members of the Leicestershire Chamber of Agriculture on July 25. In compliance with a request from the Botanical Department of the British Museum, who were making wax models of wheat plants in different

stages, samples of growing wheat had been forwarded from the farm.

The Consulting Chemist had presented the following Report which the Committee recommended for publication with the proceedings of the Council:—

Report of Consulting Chemist.

1. *Inferior Ground Lime*.—A Member of the Society made in May, 1903, a purchase of 10 tons of ground lime from a firm of merchants at York, the lime costing 18s. 9d. per ton, carriage paid. On receiving delivery, he thought it felt very gritty, and so sent a sample to Dr. Voelcker for analysis, when he received the following report:—

June 10, 1903.

Percentage of—

Lime (CaO)	64.05
Oxide of iron and alumina	5.79
Silica	15.18

"This is a very inferior and impure lime. There is over 20 per cent. of it that is stone and and other matters not ground lime."

On receiving this report the purchaser claimed an allowance, but, the vendors offering none, he declined to pay the account, and so the matter dragged on until May, 1904, when it was closed by the vendors accepting a payment of 60 per cent. of the account.

2. *Impure Bone Meal*.—A Member of the Society residing in Suffolk sent, on April 12, for analysis a sample of what had been invoiced to him as "Bone Meal," the price being 5l. 2s. 6d. per ton delivered. The report returned by Dr. Voelcker was:—

April 20, 1904.

Moisture	8.14
*Organic matter	43.17
Phosphate of lime	24.84
Carbonate of lime, &c.	16.21
Sand	7.64
	<hr/> 100.00

*Containing nitrogen	2.86
Equal to ammonia	3.47

"This is not genuine bone meal, nor is it worth anything like the price (5l. 2s. 6d. per ton) you are asked for it. A genuine sample should give 45 per cent. of phosphate of lime at least, with over 4 per cent. of ammonia. In this sample I find a quantity of cereal husks, as from oats and barley. There is also high sand and rather much sulphate of lime, with excessive carbonate of lime."

The accuracy of the sample or analysis was not called into question, but the vendors stated that the delivery (one of 3½ tons) was sent direct from a parcel which they had bought, but which was not seen by them before loading; it was guaranteed to them as being pure English bone meal of the best quality and analysis. Subsequently, the vendors wrote enclosing a credit note for allowance at the rate of 10s. per ton, which

they considered "fair under the circumstances." Dr. Voelcker, however, pointed out that this allowance was totally inadequate, and that the purchaser was entitled to claim quite 2*l.* a ton. An allowance to this extent was ultimately made by the vendors, and accepted.

3. *Sulphate of Copper*.—It is well to point out that samples of sulphate of copper sent for analysis should be put in glass bottles or wooden boxes, as if placed in common tins (tinned iron) a possible source of error may be introduced, owing to the salt acting upon the metal and causing the iron to rust.

(Signed)

J. AUGUSTUS VOELCKER.

13 Hanover Square, W.

July 26, 1904.

Mr. BOWEN-JONES said it was the intention of the Committee to go into matters during the recess, with the object of reporting what the views of the Committee were with respect to the objects, scope, and methods to be adopted in carrying out the work connected with the Chemical Department of the Society. He desired to express the sincere regret of the Committee at the loss of their colleague, Mr. Terry, who had done such excellent work in a practical way in assisting the Society, and especially in connection with the work of the Woburn Farm.

On the motion of Mr. BOWEN-JONES, seconded by Mr. REYNARD, Mr. Christopher Middleton was added to the Committee.

Botanical and Zoological.

Mr. WHEELER (Chairman) presented a Report by Mr. Cecil Warburton, the Society's Zoologist. The Consulting Chemist and Consulting Botanist had inspected and reported upon the present condition of the plots in various parts of the country on which the Society's grass experiments were carried out, and the Committee recommended that the Report be published in the next Volume of the Journal (see page 316).

Veterinary.

Sir JOHN THOROLD reported with regret the death of Professor J. B. Simonds, the Society's senior Consulting Veterinary Surgeon. An intimation was received from the Royal Veterinary College that at this year's examination of veterinary students for the Society's medals, the silver medal had been gained by Mr. Reginald L.

Phillips, of Glenleigh, Marazion, and the bronze medal by Mr. Ralph Bennett, of 13 Eastern Road, Romford.

Sir NIGEL KINGSCOTE moved that Professor McFadyean be asked to accept the honorary office of Consulting Veterinary Surgeon to the Society, in the room of the late Professor Simonds. He could say from his own experience that Professor McFadyean had really been acting in the capacity of Consulting Veterinary Surgeon to the Society for a long time past, and he had worked just as hard for this Society as for the College.

Mr. SANDAY seconded the motion, and it was carried unanimously.

Professor MCFADYEAN, in reply, said he not only accepted the Council's appointment, but he regarded it as a great honour—an honour to succeed such an eminent man as the late Professor Simonds, and also to be associated with Professor Sir George Brown. Any services which he could render to the Society he should always be ready to give.

Stock Prizes.

Mr. SANDAY (Chairman) reported that the results of the sales by auction in the showyard at Park Royal had been as follows:—Thirty-seven horses were entered for sale, and five were sold for 72*l.* 10*s.*; 124 cattle were entered for sale, and fifty-one were sold for 3,517*l.* 10*s.*; twenty-five sheep were entered for sale, and thirteen were sold for 421*l.* 1*s.*; 116 pigs were entered for sale, of which fifty-five were sold for 412*l.* 18*s.* 3*d.* The total amount realised by the sales was 5,075*l.* 19*s.* 3*d.*, as against 3,272*l.* 11*s.* in 1903.

Implement.

Mr. FRANKISH (Chairman) reported that the Judges of Miscellaneous Implements at the recent Show had awarded silver medals to seven "New Implements."

Showyard Works.

Mr. CRUTCHLEY (Chairman) reported that various matters relating to the recent Show at Park Royal had been settled by the Committee.

Selection.

Sir JOHN THOROLD (Chairman) reported the recommendation of the

Committee that Lord Middleton be elected a Trustee in the room of the late Viscount Bridport. A letter had been received from the State Agricultural Institute at Gembloux, thanking the Society for the facilities granted to the students on the occasion of their visit to the Show.

On the motion of Sir JOHN THOROLD, seconded by Sir NIGEL KINGSCOTE, Lord Middleton was formally elected a Trustee in accordance with the Committee's recommendation.

Education.

Lord MORETON (Chairman) reported the recommendation of the Committee, that Mr. Martin J. Sutton and himself be appointed as the Society's representatives upon the Oxford and Reading Joint Committee for a period of three years ending June 6, 1907, in accordance with the provisions of Decrees of Convocation of the University of Oxford, dated June 7, 1904.

Dairy and Produce.

Mr. DUGDALE (Chairman) reported that a letter had been laid before the Committee on the subject of the sale in this country of cider made in America as English cider. The Committee had carefully considered the

question, but could not recommend the Council to take any action.

Miscellaneous.

The SECRETARY read a letter, dated June 27, 1904, from Mr. Andrew T. T. Peterson, a Member of the Society, aged ninety, who, in a speech made at the General Meeting in the Park Royal showyard on June 23, suggested that every Member should contribute to a special fund for the purpose of paying off the mortgage on the show-ground. Mr. Peterson now wrote that he had himself intended to give 10*l.* a year, but wishing to secure the Society his donation promised for 1905, he sent a cheque for 20*l.*, and, if he lived, he would give 10*l.* next year all the same.

On the motion of the PRESIDENT, a cordial vote of thanks was passed to Mr. Peterson for his generous donation, and for the good wishes he expressed towards the Society.

A suggestion made by Mr. Samuel Kidner at the General Meeting on June 22, 1904, "That Regulation 31 as to the cancellation of classes in the event of there being less than three exhibitors, be reconsidered," was referred to the Stock Prizes Committee.

THURSDAY, OCTOBER 6, 1904.

LORD MIDDLETON (PRESIDENT), IN THE CHAIR.

Present:

Trustees.—The Earl of Coventry, the Earl of Derby, K.G., Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—The Earl of Jersey, G.C.B., Lord Moreton, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Mr. R. C. Assheton, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, Mr. W. Frankish, Mr. Hugh Gorringe, the Marquis of Granby, Mr. R. M. Greaves, Sir Gilbert Greenall, Bart., Mr. R. Neville Grenville, Mr. W. Harrison, Mr. James Hornsby,

Mr. J. Howard Howard, Mr. Joseph Martin, Mr. Christopher Middleton, Mr. T. H. Miller, the Rev. D. B. Montefiore, Mr. Ralph Palmer, Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. Howard P. Ryland, Mr. E. W. Shackle, Mr. A. J. Smith, Mr. E. W. Stanyforth, Mr. R. Stratton, Mr. Garrett Taylor, Lord Wenlock, G.C.S.I., Mr. E. V. V. Wheeler, and Mr. C. W. Wilson.

The PRESIDENT, in opening the proceedings, said that the Council had resumed their sittings at an earlier date than usual, in order to consider the position of the Society, especially in regard to the holding of future Shows, as to which their Implement and Stock Prizes Committees had held Conferences on the previous day with

the Exhibitors of Implements and Live Stock respectively. He thought there would be a general agreement as to the need for the existence of a National Agricultural Society such as the Royal Agricultural Society, which need was indeed recognised in all countries. It did not seem necessary, therefore, to argue the question of the usefulness of such a Society in the public interests of Agriculture generally. Such a Society must have central offices, and reasonable accommodation for the transaction of its daily business and the convenience of its governing body and its Members; and it must have a comparatively skilled staff to deal with the various demands upon the Society's accumulated information and resources made by the 9,500 members, by kindred bodies, and by the public generally.

The only comparatively assured source of income to their Society had been the annual subscriptions of the Members, supplemented (so long as the Reserve Fund lasted) by contributions, representing the share of the 3,500 Life Members, to the annual revenue. But now, owing to the Reserve Fund having been all spent in meeting the losses of recent years, and the Society's only remaining assets having been pledged to meet the expenditure and losses of the current year, 1904, the Society had (independently of other difficulties) to consider the problem of going forward for another year with only an income of 6,000*l.* from subscriptions to do all its work, and to meet the expenses of the privileges which it had heretofore accorded to a body of Members (Annual and Life) numbering 9,500.

Whatever the result of the appeal which they proposed to make to Members and to well-wishers of Agriculture generally, for funds to enable the Society to continue its public work, it would be necessary for the Society to make economies in its head office expenses, even at the cost of some temporary diminution of the high standard of efficiency on which the Society had hitherto prided itself. It would hardly be possible, moreover, to give the Members so good an annual Journal as before; and it might be difficult to continue in their present

form the scientific privileges which Members had been accustomed to enjoy, and the various Chemical, Veterinary, Botanical, Zoological, Educational and other scientific investigations which had been conducted by the Society for the benefit of agriculture generally.

The several services in all departments of the Society's work, other than the expenses of actually preparing for and holding the Annual Show, had latterly cost the Society 9,000*l.* a year. It had been heretofore possible to meet this out of the annual subscriptions and contributions from the accumulated Reserve Fund; but as the latter source of revenue no longer existed, it would be necessary for the Council to consider to what departments of the Society's work, and in what proportions, it could allocate the annual subscriptions which it might expect in the future to receive, and which it might be hoped would exceed the 6,000*l.* at present subscribed.

And here the great difficulty arose that no provision could possibly be made, except at the sacrifice of practically all the Society's other work, for a grant to the Show from the subscriptions. The underlying idea had been in the past that the ordinary staff of the Society (with the attendant expenses for house accommodation and office charges) were available to undertake such part of the Show preliminaries as could be done at headquarters; the return for the services so given by the Society being the receipt by every Member of a free ticket of admission, and by such Members as exhibited live stock, &c., of much reduced fees for entries. It was obvious that so efficient a staff could not, without increased expense, be retained for the exclusive purpose of Show preparation, if the organisation of the Show were entirely separated from that of the Society's other work.

If it were assumed that the old plan were continued of organising an Annual Show as part of the Society's public duties, the grave question arose, How was the possible and, it was to be feared, inevitable loss on the holding of the Show itself to be dealt with?

The total expenses of the Show of 1904 had been in round figures 21,500*l.*, and the total receipts had been only 14,500*l.*; so that the Society had incurred a loss on the Show of 7,000*l.* In the last seven years the expenses of the Show had never been so low as 20,000*l.*; but assuming that, as compared with the Show of 1904, economies of as much as 1,500*l.* be effected, what could the Society expect in the way of recouping itself for a certain outlay of 20,000*l.*, an outlay upon which it must adventure before the doors of the Show could be opened to the public? If the exhibitors of implements should come in equal numbers and take as much space as they did in 1904, and if there were as many entries of live stock, &c., as in 1904, the total money received by the Society from these sources would be some 8,000*l.* to 8,500*l.* Thus there would be a deficit of some 11,500*l.* to 12,000*l.* to be made good before the Show could, in ordinary parlance, pay its way. The only source of further revenue for the Show was the money paid by the outside public for admission at the gates, for seats on the stands, and for catalogues.

In 1903, when the weather just before the Show was very bad, and Park Royal was not well known, the Society received 8,000*l.* from these sources. This year, when great efforts had been made at much expense to make Park Royal known to Londoners, when the weather was good, and every circumstance seemed to be in the Society's favour, the total takings at the gates were the very disappointing amount of 5,600*l.* Making every allowance for the difficulty of getting a new place known to Londoners, especially so long as its main approach by rail was still only open to local traffic, the only inference to be drawn from recent experience was that the industry of agriculture is of little interest to Londoners, and that their attendance in great numbers could not be relied upon, at any rate in the immediate future. More than this 5,600*l.* could not be counted on for a Show next year in view of the risks of the weather. Thus the deficit of 11,500*l.* to 12,000*l.* referred to above would only have been reduced by

the receipts from admissions to some 6,000*l.* to 6,500*l.* The Society had no funds whatever to meet any such loss as this; and the Council could not obviously, in the present state of the Society's finances, sanction a certain expenditure of not less than 20,000*l.*, with a possibility of a loss on such outlay which was hardly likely to be less than 6,000*l.*, and might be much more, which loss, represented by obligations to tradesmen, workpeople, and prize winners, the Society had no means of paying.

After, therefore, making allowance for every possible economy in administration, it appeared necessary for those interested in the holding of the Show, *i.e.*, for exhibitors of every kind, and all those who believed in the necessity for a central comprehensive Show of live stock, implements, and all things concerned with the great industry of Agriculture, to decide whether they wished the Annual Show continued, and, if so, were prepared, either by guarantees or otherwise, to secure the Society from the loss which the holding of the Show must almost inevitably entail, and which the Society was not at present in a sufficiently strong position to face.

These were the considerations which had weighed with the Council in seeking the opinions and the advice of the Exhibitors of Implements and the Exhibitors of Stock at the Conferences held on the previous day; and he thought he should be only expressing the general wish of the Council in thanking those gentlemen for their cordial response to the Society's invitation, and for the valuable suggestions and advice which they had given. He would now call on Mr. Frankish, as the Chairman at the first meeting, to acquaint the Council with the results of the Implement Committee's conference with the exhibitors of implements, which he thought all those who were present would feel had been conducted in a very businesslike, helpful, and kindly spirit towards the Society.

Mr. FRANKISH said that the results of the Conference over which he presided might be best summarised in the subjoined resolutions, passed by substantial majorities by the exhibitors of implements present on October 5,

the members of the Society's Implement Committee not voting :—

(1) That in the opinion of the implement exhibitors present at this meeting it is desirable that the Show of 1905 be held at Park Royal.

(2) That it is desirable that the Shows after the year 1905 should be migratory.

(3) That the fees for implement shedding should not be increased, but that they remain as this year.

(4) That the Show of 1905 should open on the Tuesday morning and close on the Friday night.

(5) That it is advisable that the Show should be held in the second week of July.

(6) That this meeting of implement exhibitors pledges itself to give a general support to the Council in holding the Show of 1905.

(7) That Members of the Society should be asked to increase their subscription to 2*l.* a year, and that the Life Members be asked to contribute 1*l.* annually for a certain number of years.

There was also a suggestion made at the conference for the appointment of a Consultative Committee of implement exhibitors to confer with the Council on matters relating to the Implement Department of the Show.

Mr. SANDAY said that the meeting of the Society's Stock Prizes Committee with the exhibitors of live stock and representatives of the Breed Societies was hardly so helpful in the direction of formal resolutions as the Implement Conference, as those present hesitated to commit themselves with regard to the Show, except in expressing a feeling that it ought to be continued in the general interests of Agriculture. Incidentally there was a strong expression of opinion by many exhibitors, who spoke as Members, that the Society's Charter needed alteration as to the methods of election to the Council, so as to secure a more direct interest by Members in their representation on the Council. This was a feeling with which he thought most of them sympathised; but they had had no alternative, whilst the Charter remained as it was, than to conduct the elections in the way which it prescribed. An amendment to the Charter was not to be obtained in a moment, and would, of course, involve expense; but he thought it might clear the ground somewhat if the Council definitely expressed their willingness and desire that this change should be made; and accordingly it

might be well that they should pass a resolution to this effect. The Society's Solicitors, and no doubt Counsel, would have to be consulted; and as they would need instructions, it would be desirable for a Committee of the Council to be appointed to consider what had best be done.

After a short discussion, the following motion, proposed by Mr. STRATTON, and seconded by Mr. SANDAY, was carried unanimously :—"That steps be immediately taken to obtain such alteration in the Charter as will enable the Society to re-arrange its system of appointing the governing body, with a view to its being placed on a representative basis, and for such other purposes as may be considered necessary."

On the motion of Mr. BOWEN-JONES, seconded by Mr. WHEELER, the Committee was constituted as follows :—The President, the Earl of Derby, Sir John Thorold, Sir Nigel Kingscote, Sir Jacob Wilson, Mr. Crutchley, Mr. Harrison, Mr. Ralph Palmer, Mr. Sanday, and Mr. Stratton.

On the general question of the future of the Shows, the Earl of DERBY said he thought it would be recognised that, whatever might be decided in the future as to the location of the Society's Shows, it would be impossible now for the Society to arrange for a Show to be held next year anywhere than at its existing and ready prepared showyard. If, therefore, a Show were held at all by the Society in 1905, which must of course depend upon the amount of financial support received, it could only be at Park Royal. They had heard from the President that an outlay by the Society of not less than 20,000*l.* would probably be necessary for this purpose; and to recoup this they had only the entry fees for stock and implements, and the takings at the gates. Obviously the Council could not, in the present state of the Society's finances, sanction any such outlay as this without being guaranteed by their Members, exhibitors, and others, against a loss which the Society would have no means of meeting; and he thought, therefore, they would all agree that an appeal must be made to those interested in the Society for funds to enable them to go forward with a Show next year.

Sir JACOB WILSON thought it would be premature for them to discuss at this stage the question of continuing at Park Royal or of reverting to migratory Shows, but in regard to next year, they had been strengthened very much by what had occurred at the conferences on the previous day, when both bodies were enthusiastic in their expression of opinion that there must be a Show of some sort next year. The Society's Show was the outward and visible sign of the existence of the Society. If there were no Show, then they might say "good-bye" to the Society. On the other hand, it was obvious that they must go to Park Royal, if anywhere, in 1905, but the Society must be placed in a position which would render it entirely independent of the gate money.

Mr. RALPH PALMER hoped he would be forgiven as a new Member of the Council for totally disagreeing with the proposition that had been made. They could not expect any financial support until they were reconstituted under a new Charter. He suggested as an alternative, that the Society should abandon the Show for one year, and in the meantime their finances would be rehabilitated; also that a Committee be appointed to consider their relations with the Park Royal Company and the Show-yard. This was a drastic, but an honest course, and one which was sound. Until they had a new Charter, they would be unable to go before the world with a perfectly clean slate.

The Marquis of GRANBY said that whilst they might be able, by some means or other, to obtain sufficient money to carry on the Show next year, he did not think that, unless some rich person came forward and presented the amount *en bloc*, the necessary sum would be forthcoming. In any case, they would not be one whit more forward in the direction of relieving the Society from the terrible condition of debt in which they were at present. On the contrary, they would be certainly in a worse position than they were now. Interest had to be paid on the money which the Society had borrowed, and they were at this moment without any further asset

to pledge, besides which they must pay off those gentlemen who had so kindly guaranteed the money to keep them afloat. Their Society at the present time was short by 3,000*l.* per annum on the General Account, apart from the administration of the Show. The Society needed to be reconstituted from top to bottom. Without doing this, it was proposed to face a Show which cost 20,000*l.* at the least for one year without taking into consideration the circumstances of their present financial position. He would far rather see propositions made to the Members by which it might be shown that they were all trying to carry on their affairs on a very much smaller basis, if necessary, than they were at present, and to take steps to clear off their present liabilities in order to prevent the Society from being wound up.

Mr. PELL expressed his agreement with Lord Derby that they could not hold a Show at Park Royal in 1905 unless a sufficient guarantee fund was raised. They had better settle that question as soon as possible.

Mr. HORNSBY agreed with Lord Granby that they should draw the Society to a close and start afresh, and he thought that before any decision was come to with regard to next year, some plan ought to be laid before their Members as to the possibility of carrying on the Show with some prospect of success.

Lord WENLOCK inquired whether, if it should be decided to hold a Show in 1905 upon a sufficient sum being guaranteed, it was also intended to pay off their present liabilities as well as the expenses of next year's Show. He thought it desirable that they should know exactly what their position was, and he could not support Lord Derby's proposal until it was more clear as to what their future position was to be.

The Earl of JERSEY agreed with Lord Wenlock and Lord Granby, who had raised the vital question of the honour and existence of the Society. They were in an awkward financial position, and they were not trying to relieve that pressure. Simply trying to get a guarantee to hold another Show would not help

to diminish their liabilities. What they had to do was to try and place the Society in the eyes of the public upon a sound financial basis. Unless they showed the public that they were determined to face the position and to pay off their debts before going on with another Show, they would not get the general support they desired. He would be very sorry if the Show were not held. If it were not held it would create a terrible blank in the history of the Society. At the same time, when they were in a dangerous position like theirs, some sacrifice must be made of their sentiments in the matter. First of all, it was necessary to decide how they could place themselves in a better position before the public, and they could not do this until they decided how they would meet their present liabilities. If the proposition put forward by Lord Derby were pressed, he felt that he must certainly oppose it.

Mr. STRATTON thought it most important that the continuity of the Show should not be broken. If they once broke that continuity it would be a serious blow to the reconstitution of the Society. The Royal Agricultural Show was a great national agricultural asset to the breeders of pedigree stock in this country. Foreigners came to the Show to purchase stock, and looked forward to it, and animals were being prepared for it. That appeared to be the feeling at the Conferences held on the previous day. If an appeal were made to the exhibitors and Members they would make an effort to maintain the Show. It was true they were in a bad financial position, and no doubt they were putting the cart before the horse in not giving consideration to the position of the Society first. However, as the question of the holding of the Show had been brought forward, he thought they should go on with it on the lines suggested by Lord Derby.

Colonel CURTIS-HAYWARD expressed the opinion that it was generally felt, rightly or wrongly, that the cause of their disaster was the action of the Council in abandoning the system of migratory Shows.

He had been satisfied at the time that it was absolutely necessary to abandon the country meetings because of the difficulty of securing suitable sites. Several of the towns in giving invitations had done so on the ground that it was the last time that they could receive the Society. That was a point which had not been brought forward sufficiently clearly. He knew that Sir Jacob Wilson had proposed that they should reduce the size of their Shows; and no doubt if that were done the Society's Shows might be continued. He would like to suggest that means should be taken to ascertain the number of towns with suitable sites on which a Show on their present scale could be held; and he believed if this were done they would find that only a small number would be available, and they could not visit the same town again at intervals of less than ten years.

Mr. RANSOME said there could not be any doubt whatever that the exhibitors of both machinery and stock would be very sorry if they were to discontinue their Show. He thought a guarantee fund a very desirable thing, if the Show were once started upon a business footing, and could pay its way. Before they determined to hold a Show next year, they should appeal to their Members to see whether they were willing to increase their subscriptions—not merely for one year. If the Royal Agricultural Society were of value to the country generally, he thought £27, as against £17, would not be at all too much to expect the Members to pay. No doubt some alteration in their income might be effected by a revision of the entry-fees. He had ventured to point out at the Conference the previous day that the fees paid by exhibitors in one portion of the Show were not equal to those contributed by exhibitors in the other portion of the Show. It was necessary that a greater equality should be established between them, and until this was done they would not get a general support from the implement exhibitors. Hitherto the success of the Society's Show had been dependent upon the shillings received at their entrance gates from the working man. They

could not go on looking to other people to help them; but those interested in the Show must be willing to support it for their own sake, as they would any other business concern.

Mr. GREAVES expressed the opinion that the Society would be running a very grave risk of losing a large number of their Members if they did not hold a Show next year.

Mr. HARRISON said he was sorry to see the pessimistic feeling that seemed to prevail amongst the Council. He quite recognised the gravity of their present financial position, but he did not think that doing away with the Show next year would be the right means of placing themselves on a sounder basis. There was no doubt that the feeling at the Conference with the implement makers on the previous day was that a Show should be held next year, and that no greater disaster could occur than its discontinuance. There was a great diversity of opinion regarding Park Royal and migratory Shows, but there was no doubt in his mind that if a Show was to be held in 1905 it must take place at Park Royal. If the Society was to be placed on a sound financial basis it was to their Members that they must look for aid.

Mr. CHRISTOPHER MIDDLETON said it would be most disastrous if they did not hold a Show next year, for they would be certain to lose at least 2,000 Members. When the Members were communicated with it should be made clear that they were only pledged to hold the Show of 1905 at Park Royal, and that it would be left to the Council elected on the proposed representative basis to decide as to the future of the Shows. In the north of England there was a strong feeling that the Show which appealed to London was not the Show which appealed to the Members of the Society, and that a Show which would cater for a London public was one that was derogatory to a Society like theirs. He was quite certain that Members would support next year's Show as far as they were able. He hoped that some economies would be effected, as they were now spending 3,000*l.* more than their income. On this understanding Members would

rally round, and, so far as they were able, would guarantee the Show of 1905.

Mr. CRUTCHLEY pointed out that even if no Show were held in 1905 it would not relieve the Society of some very heavy and inevitable expenses. They had a permanent staff connected with their Surveyor's Department who had to deal with the erection of the Show. They had money invested in the Showyard, the recoupment of which was spread over a number of years, and they had to pay interest on their capital outlay whether they had a Show or not. Therefore, if no Show were held in 1905, there would still be a very considerable expense to be met. Further, the truth mentioned by Mr. Ransome had hardly been realised with regard to the Show at Park Royal, viz., that other people not practically interested in agriculture had provided them with an Agricultural Show in the past; but that now the agriculturists of England had to pay for their own Show. The time of going to Park Royal seemed to have coincided with this change. Some heavy expenses which were formerly borne by local committees had now to be defrayed by the Society itself. When they began the arrangements for the Park Royal Show of 1904 the hope was held out that there would be very considerable economies in the administration, and, as a matter of fact, the expenses of the present year's Show were almost the lowest on record. The actual cost of the erection of the Showyard was greatly reduced, and if they held a Show in 1905 at Park Royal the reduction would again be considerable. A further heavy expenditure had been incurred in the hope of attracting the public in connection with the advertising. His own belief was that, if the Show was held at Park Royal another year, they might, by the light of the experience of the two previous years, considerably curtail this expense. Apart from advertising, these economies were strictly connected with the holding of the Show at Park Royal, and were not economies that could be promised for a migratory Show. The present buildings could

be left up, and there would consequently be less expenditure on labour; but he would remind the Council that this would depend upon the present character of the Show being adhered to, and on their following very much the lines of last year. Any curtailment, for instance, in the exhibition of implements would involve the rebuilding of the shedding, altering the line of sleeper roads, the re-erection of sheds, &c.

Mr. HOWARD thought that it would be fatal to the interests of the Society to drop the Show next year. If this were done, the Show might be dropped for ever. There was one matter which he was of opinion should certainly be cleared up and put before the Members before any application was made for further subscriptions. A few months ago he had voted in that room for certain reductions to be made in the expenditure of the Society. He understood that nothing had yet been done in the matter, and he thought that if the notices contemplated in the recommendations adopted by the Council had not already been given, they ought to be given at once.

Mr. STANYFORTH was very glad this question had been raised. It was one of the gravest indictments against the Society that for several years past they had been spending much more than their income in connection with general administration and their scientific objects. An excellent Committee was formed last year, who took an immense amount of trouble in going into the Society's affairs. That Committee had made certain recommendations, which recommendations had been adopted by the Council, and he wished to ask what had been done in the matter. He considered that they might easily reduce the cost of the Journal, and the cost of the scientific sections down to at least half of what they were at the present moment. He did not wish to decry the usefulness of these different departments, but if they had not the money to carry them on as heretofore, it really could not be helped, as it was perfectly impossible to carry on the administration of the Society at the expense now being incurred. The first step should be that the recommendations which

had been passed by the Council should be given effect to, and in his opinion the Committee should be asked to sit again and consider the question further.

With regard to their house, they could not afford to go on using it as they were at the present moment. There were certain things that must be reduced. He considered that it was absolutely necessary to have a Show if they wanted to keep their Members. If they gave up the Show next year they would lose a great many Members, and to break the continuity of the Show would be fatal. On the other hand, it would not be possible to have a Show unless they had a sufficient guarantee fund for this particular Show, and it would also be necessary to have a real propaganda to issue to their Members as to what was being done. If they did this, they would regain the confidence of their Members. Unless they regained their confidence, they could not get their money, and without money they could not carry on the Society successfully.

The PRESIDENT said he understood that the Report of the Sub-committee of the Finance Committee had been referred to the several spending Committees concerned, and that a certain number of recommendations had been carried out.

The Earl of COVENTRY expressed an earnest hope that the Council would not divide upon this question. He was one of those who thought it would be most disastrous to the interests of that great Society, which had existed for sixty-six years, and which had done such an inestimable amount of good, if they were to abandon their Show for one year. If such a course were taken there would be a great complaint, general grumbling and dissatisfaction, and a great diminution in the number of their Members. He was present himself at both the meetings on the previous day, and he gathered that there was an unanimous feeling on the part of those present that the Show should be held next year. He trusted that Lord Derby's suggestion of a guarantee fund would be adopted.

Lord GRANBY said he had an amendment to move to the motion

which had been proposed, as he much regretted that he was unable to agree with what had been said by the supporters of that motion. He therefore moved :—"That no recommendation as to the holding of the 1905 Show be made until steps have been taken to place the funds of the Society on a sound financial basis." His reason for moving that amendment was that he felt that they could not go and meet their Members and say merely that a Show was to be held under a guarantee, as this would be facing the Members under false pretences. They could not make any recommendation in these peculiar circumstances, without laying before their Members more fully the financial position into which the Society had drifted. He believed it possible to get the Society re-organised, but it was for the general body of the Members to decide, after having heard the facts, whether they would hold a Show at Park Royal next year or not.

LORD WENLOCK, in seconding this amendment, said he felt that they were leaving out of sight the load of debt for which they were paying 4 per cent. interest a year.

SIR JACOB WILSON failed to see how they were going to the Members under false pretences. The proposal made only referred to the Show of 1905.

MR. STRATTON said that if the amendment was carried, it was quite clear that there would be no Show next year. He believed that they were all absolutely agreed that the finances of the Society must be put on a proper footing. There was, however, one point to be settled, viz., the amount of the guarantee fund to be asked for.

LORD JERSEY asked if it would not be better to get a guarantee from the Members to pay off what the Society already owed, instead of utilising it for the holding of a Show next year.

LORD DERBY said he quite understood the feelings by which his noble friend, Lord Granby, was influenced. He desired, however, to point out that the actual proposition before the meeting was, though expressed positively, really a negative one, viz., that they should not go forward with the question of holding a Show without a

sufficient guarantee. Were they not mixing up three things: (1) the present embarrassment of the Society, and the steps that had been taken so far to remedy it, (2) the proposition about the Show of next year, and (3) the future position of the Society? He agreed entirely with what had been said with regard to these points. First of all, it appeared desirable to clear off the liabilities of the Society as soon as they could make arrangements to do so. A Committee, of which he was a member, had been formed, and their recommendations had been referred to the different Standing Committees that had to deal with the departments concerned. These Committees were to make their Reports to the Council, as they would in the case of any other business. With regard to the future, he thought they were all agreed as to the necessity for having a new Charter. That, however, was a matter which could not be hurried over. He believed that the matter would have to go to various Government Departments which were not exactly expeditious in their proceedings. Their plan for the future should be to wipe out the past before they started upon a new course, but if the Show was to be held next year it must be held before the new condition of affairs could be evolved, for he thought they were all agreed it would be a disaster if it were not. This being so, let them take the necessary steps to deal with the question. If it were possible to hold another Show next year (and it rather passed by assent that it was desirable), and it being admitted that Park Royal was the place where the Show should be held (partly on account of time and partly on account of facilities), then it left the question of the future of the Society open for further discussion.

MR. CRUTCHLEY explained, in reply to a question, that the estimate of 20,000*l.* covered the whole expense of the Show, without taking into account the receipts.

MR. C. W. WILSON asked if they only obtained, say, 12,000*l.*, why was there any necessity to hold a 20,000*l.* Show? The reduction could be effected by omitting some of the classes.

SIR WALTER GILBEY reminded the Council that on a previous occasion they had asked for a certain sum of money, and it had been obtained. If the Council were going to ask for money now, they must make application for a definite amount. He had the greatest respect for the implement makers, but any expression that came from the conference with the stock exhibitors had more weight with him than the views of the implement makers, because all farmers were either stock-keepers or stock-breeders, and they represented the Members of the Society throughout the United Kingdom.

The Rev. D. B. MONTEFIORE thought it would be a pity if the remarks which had fallen from Mr. Wilson were left undiscussed. To his mind, he did not see why they should have a 20,000*l.* Show. If the Show were discontinued, it would, as Lord Derby had said, create a blank in the history of the Society. The Bath and West Society had a very good 10,000*l.* Show; of course, the Royal Show was better, but why should they hold a 20,000*l.* Show if they could not afford it? Should the Council make an appeal to the Members, they might ask the question—"Is the Show the only part of the work of the Society that requires a guarantee fund?" The Members might say the Society already had 6,000*l.* of their money, and what part of that sum were they proposing to set aside towards meeting any possible loss in connection with the holding of a Show in 1905?

After some further discussion, the PRESIDENT put Lord Granby's amendment to the meeting, when there appeared thirteen votes for and twenty-eight against it. The amendment was therefore declared to be lost.

On the motion of Mr. STRATTON, seconded by Mr. SANDAY, it was then formally resolved :—

That the Show of 1905 be held at Park Royal in the second week of July,¹ subject to a guarantee fund of 10,000*l.* being raised by subscriptions from Members, exhibitors, and others towards defraying the expenses of the Show.

¹ Subsequently, on January 11, 1905, it was decided that the Show of 1905 should be held on the four days from Tuesday, June 27, to Friday, June 30, inclusive.

This resolution was remitted to the Charter Committee previously appointed on Mr. Stratton's motion, with instructions to prepare and issue a circular to Members and others asking for subscriptions to enable the Show of 1905 to be held.

Mr. HARRISON, on the resumption of the discussion on the general position of the Society, said that, independently of the resolution just adopted, he wished to suggest that the Finance or any other Committee be requested to prepare a report, to be brought forward at the next meeting of the Council, showing the probable cost of next year's Show, the suggested modifications in the administration at Hanover Square, and the steps proposed to be taken with respect to the Society's Charter. If such a statement could be sent out to their Members, showing that the Council desired to effect economies in connection with the cost of the Show of 1905 and the administration at Hanover Square, and indicating what was intended in regard to the Charter so as to provide for a more democratic representation on the Council, it would be more advantageous than if the request for 10,000*l.* were not accompanied by any Report from the Council. He wished to propose this, because at the meeting of the stock exhibitors on the previous day he gathered that these were the points to guide them as to their contributions towards a guarantee fund.

Sir NIGEL KINGSCOTE observed that as the Council were determined to try and hold a Show next year, they must now endeavour to find out whether they could raise a guarantee fund. It was impossible to give any exact estimate as to what the cost of the Show might be. With regard to other economies in administration, he would point that the recommendations of the Sub-committee of Finance had been referred by the Council to the several spending Committees concerned, who were now considering what could be done to give effect to them. With regard to the staff, there had already been economies in the clerks; and the higher officials had placed themselves in the hands of the Finance Committee in the matter of their

remuneration. As the Finance Committee had already reported, the Council were all impressed with the necessity of economy and of the curtailment of expenses, whatever might be the decision as to the future: but the particular directions in which these were to be effected must necessarily depend upon what might be decided as to the spheres of usefulness of the Society after the present year.

After some further discussion on this subject, in which Lord MORETON, Mr. PELL, Mr. RYLAND, Mr. STANYFORTH, Sir WALTER GILBEY, Mr. RANSOME, Mr. CRUTCHLEY and Mr. MONTEFIORE took part, and in the course of which the SECRETARY made a statement as to his personal position as regards the Sub-committee's recommendations,

Mr. HARRISON said he would not press his motion on that occasion on the understanding that the matter would receive the attention of the Committees concerned.

The PRESIDENT said he thought the different Committees of the Society were trying in every way to reduce expenses, but at this particular moment he did not think it would be wise to restrict their expenses in such a way as would injure their work in preparing for the Show.

Mr. CORNWALLIS gave notice that at a future meeting he would move:

That the Annual Members be asked to increase their subscriptions, and that Life Members be asked to give an annual subscription, stating in each case whether they wish such increased subscription to be applied to the Show, or to the general work of the Society.

WEDNESDAY, NOVEMBER 2, 1904.

LORD MIDDLETON (PRESIDENT) IN THE CHAIR.

Present:

Trustees.—Earl Cawdor, the Earl of Coventry, Earl Egerton of Tatton, Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingscote, G.C.V.O., K.C.B., Viscount Ridley, Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., the Earl of Feversham, the Rt. Hon. Sir Massey Lopes, Bart., Lord Moreton, the Hon. C. T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Viscount Baring, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, Mr. W. Frankish, the Marquis of Granby, Mr. R. M. Greaves, Sir Gilbert Greenall, Bart., Mr. R. Neville Grenville, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. James Hornsby, Mr. R. M. Knowles, Capt. W. S. B. Levett, Mr. H. D. Marshall, Mr. Joseph Martin, Mr. Christopher Middleton, Mr. T. H. Miller, the Rev. D. B. Montefiore, Sir P. Albert Muntz, Bart., M.P., Mr. Ralph Palmer, Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. Howard P. Ryland, Mr. E. W. Shackle, Mr. A. J. Smith, Mr. E. W. Stanyforth,

Mr. R. Stratton, Mr. Garrett Taylor, Lord Wenlock, G.C.S.I., and Mr. C. W. Wilson.

Election of New Members.

The minutes of the last meeting of the Council, held on October 6, 1904, having been taken as read and approved, the election of twenty-four new members was proceeded with.

Financial Position of the Society.

The PRESIDENT stated that, in accordance with the instructions given at the last meeting of the Council on October 6, the Charter and Appeal Committee had drawn up and circulated an appeal to the Members asking for subscriptions to the Fund of 10,000*l.*, the raising of which it had been agreed was a condition preliminary to the organisation of a Show by the Society next year. So far the Council had received promises of support from some 495 Members of the Society to the total amount of 3,434*l.* Fresh contributions were, however, being received daily, and in view of the fact that only a fortnight had elapsed since the issue of the appeal, it was for the Council to consider whether they would come to a decision

on the subject that day, or keep the fund open for another month until the December meeting.

Sir NIGEL KINGSCOTE said that in view of the statements that had appeared in the Press and elsewhere as to the financial position of the Society, and as to paying off its existing obligations before undertaking another Show, the Finance Committee thought it right to point out that there was ample margin in the assets of the Society for the 15,000*l.* which it had been decided last July to borrow from the bank, if and when required, on the guarantees of certain of the Trustees. But as such assets were not immediately realisable, the Trustees in question had guaranteed the Society up to the amount stated until July 31, 1905, to enable the Council to have time to consider the Society's position, but meanwhile to discharge its obligations for the last Show and its outgoings up to the end of 1904.

If, as had been suggested in some quarters, the debts of the Society should be liquidated before any other steps were taken, the Committee desired to point out that one method of accomplishing this would be by the sale of the Park Royal estate, which, however, the Committee did not recommend. The Society owned, through its holding of all the 15,000 shares in Park Royal Limited, 101 acres of land at Park Royal which the original vendor was willing to buy back at the price stipulated in the original agreement, viz., 375*l.* per acre (as against 250*l.* per acre paid by the Society in 1901), or 37,875*l.* in all. In addition there were other properties at Park Royal in the possession of Park Royal Limited, which were estimated to yield 8,140*l.* From this total of 46,015*l.* would have to be deducted the 22,000*l.* mortgage secured upon the property and the capital value (say 600*l.*) of the Society's obligations towards the maintenance of a road adjoining the Estate, thus leaving a surplus on realisation of 23,415*l.*

The Society itself had, at Park Royal, plant (Western Entrances, Pavilions and Offices) estimated to be worth 2,000*l.*, and timber valued at 2,200*l.*

At Harewood House, the Society had fixtures standing in the books at 2,047*l.*, furniture 2,390*l.* and pictures and books 1,500*l.*; and it possessed 13,100*l.* of the Harewood House stock, acquired at a cost of 13,144*l.* Adding 329*l.* machinery, and 750*l.* Pot-culture buildings at Woburn, the Society's assets other than those located at Park Royal might be taken, as a going concern, as worth 20,157*l.*

The Society would at December 31, 1904, owe its Bankers about 12,000*l.* (the old loan of 1903, secured on the Harewood House stock), besides 3,000*l.* (new Loan of 1904, under the guarantee of certain of the Trustees). It had borrowed 7,500*l.* on a second mortgage at 4 per cent on Harewood House, in order to pay the cheques due for the prizes awarded at the last Show. The interest accrued and accruing to December 31, 1904, on the above Loans was 350*l.* and six months' interest, rates and taxes, &c., on the Park Royal estate to March 31, 1905, would amount to about 1,000*l.*

The total assets of the Society might therefore be taken as 47,772*l.* (23,415*l.* + 4,200*l.* at Park Royal, 20,157*l.* at Harewood House and elsewhere), less 23,850*l.* loans and obligations, or a surplus as a going concern of 23,922*l.* over its liabilities.

After a long discussion in Committee of the whole Council, in which the Marquis of GRANBY, Sir ALBERT MUNTZ, M.P., Mr. STANYFORTH, Sir JACOB WILSON, Lord WENLOCK, Earl EGERTON OF TATTON, Earl CAWDOR, Mr. HARRISON, Mr. PELL, the Earl of FEVERSHAM, the Hon. CECIL PARKER, Sir WALTER GILBEY, Mr. RANSOME, Mr. C. W. WILSON, Mr. RALPH PALMER, Sir NIGEL KINGSCOTE, Mr. MARTIN, Mr. STRATTON, the PRESIDENT, Mr. CRUTCHLEY, Viscount BARING, and Mr. CHRISTOPHER MIDDLETON took part, it was eventually decided, *nem. diss.*, on the motion of Earl CAWDOR, seconded by the Hon. CECIL PARKER—

That the list of Subscriptions in reply to the appeal for funds be kept open until the next meeting of the Council, and that the Finance Committee be requested to circulate amongst the Members a Memorandum as to the actual financial position of the Society, and to endeavour to obtain further contributions to the fund.

The Reports of the various Standing Committees were then presented and adopted as below :—

Finance.

Sir NIGEL KINGSCOTE (Chairman) presented the customary statements of receipts and expenditure during the period since the Committee's last report in July. The draft Balance-sheet for the Show of 1904 had been submitted to the Committee, and had, subject to an adjustment of the item for "rent," been referred by them for audit to the Auditors appointed by the Members (see pp. xx-xxiii). With regard to the cost of the staff, the Committee would be able for 1905 to effect an economy of 900*l.* per annum, the Secretary having assented to a reduction by 300*l.* per annum in the amount of his salary as fixed in April, 1893, and the Assistant Director's salary having also been reduced by consent by 200*l.* per annum, the remaining reductions representing savings in clerkage, &c.

House.

Sir NIGEL KINGSCOTE (Chairman) reported that the Committee had given renewed consideration to the question of letting off to tenants a portion of the Society's house, and had decided that the four rooms on the ground floor of Harwood House with frontages to Hanover Square and Harwood Place, with, if found necessary, a portion of the basement, might be set apart for the purpose, and placed in the hands of agents for letting.

Journal.

Sir JOHN THOROLD (Chairman) presented various printing accounts for payment and also the Committee's proposals as to the contents of Volume 65 of the Journal to be issued in respect of the current year, 1904. With regard to future Volumes, the Committee felt it would not be practicable to produce a Journal on the same lines as at present, at the cost of 1,000*l.* per annum, as had been suggested; but if this limit were adhered to, the Committee could issue a Volume containing as its chief features the Reports of the Society's various scientific officers and the records of the Society's proceedings within approximately that limit.

Chemical and Woburn.

Mr. BOWEN-JONES (Chairman) submitted for approval the details of a new arrangement proposed to be made with the Society's Consulting Chemist, under which a fixed salary would in future years be paid to Dr. Voelcker as Consulting Chemist to the Society for Reports and further information required arising out of his analytical work or otherwise; for research investigations conducted for the Society; for expert supervision of the experimental work at the Woburn Farm and Pot-culture Station; also for the conduct of research work under the Hills' Bequest. The salaries of all assistants, both at his own laboratory and at the Pot-culture Station, would be paid by Dr. Voelcker. Analyses for Members of the Society to be undertaken at his own expense by Dr. Voelcker, who would take the fees on a scale to be approved by the Committee, not exceeding the present charges. The salary for Dr. Voelcker to be fixed at 750*l.* per annum, from which a charge not exceeding 200*l.* would be incurred for the qualified assistant, &c., now at the Pot-culture Station, thus making Dr. Voelcker's personal remuneration 550*l.* a year, instead of 700*l.* a year as before, a reduction of 150*l.* a year, to which Dr. Voelcker had generously signified his assent. A report was also presented as to the operations of the Woburn Farm.

Botanical and Zoological.

Mr. REYNARD brought up a report from this Committee dealing with the Society's experiments as to the eradication of weeds, the inspection during the past season of the experimental grass plots, and the forthcoming Annual Reports of the Consulting Botanist and the Zoologist.

Veterinary.

The Hon. CECIL PARKER (Chairman) reported that the Society's Medal in Silver and Bronze had been issued to the candidates placed first and second respectively at the examinations of the Royal Veterinary College last July for proficiency in Cattle Pathology, the names of the successful candidates being Mr. Reginald L. Phillips, of Glenleigh, Marazion,

Cornwall (silver medal), and Mr. Ralph Bennett, of 13 Eastern Road, Romford, Essex (bronze medal).

Stock Prizes.

Mr. SANDAY (Chairman) reported the results of the Conference held on October 5 with representatives of the breed societies and exhibitors of live stock. Various offers of champion and other prizes from Breed Societies had been laid before the Committee, and their consideration had been deferred for the present.

Implement.

Mr. FRANKISH (Chairman) reported the result of the Conference with exhibitors of implements on October 5.

Showyard Works.

Mr. CRUTCHLEY (Chairman) reported that the accounts in connection with the late Show at Park Royal, the construction of the showyard, and the management of the Show had been laid before the Committee and passed, subject to audit by the Society's Auditors. The Superintendent had submitted a comparative statement of the cost of erecting the Shows for the last four years. The Show of 1904 cost 5,867*l.* 13*s.* 11*d.*, that of 1903, 9,093*l.* 18*s.* 6*d.*, that of 1902, 7,295*l.* 4*s.* 10*d.*, and that of 1901, 8,552*l.* 19*s.* 6*d.*

The Committee had heard with regret of the death, on October 17 last, of Mr. Wilson Bennison, Consulting Surveyor to the Society.

Death of Mr. Wilson Bennison.

Mr. CRUTCHLEY, in moving that a vote of condolence be sent to the family of the late Mr. Wilson Bennison, said that many Members of the Council knew that Mr. Bennison had been a most valuable official of the Society. He took office as surveyor in 1880, and resigned owing to ill-health in 1896.

Sir JACOB WILSON, in seconding the motion, said he did so as having been Honorary Director during the time that Mr. Bennison was in active employment by the Society. Mr. Bennison came in after the Bristol Show. He revolutionised the organisation of their showyard, and had been a most valuable servant of the Society.

The resolution was adopted unanimously.

Selection.

Sir JOHN THOROLD (Chairman) presented the Committee's recommendation as to the nomination of two new Members of the Council to fill the vacancies caused by the deaths of Lord Bridport and Mr. J. P. Terry. The Committee recommended that the usual meeting of Governors and Members of the Society held in December be convened for Thursday, December 8, and that the meeting be made special for the purpose of considering the position of the Society.

Education.

Mr. DUGDALE reported that the Ninth Annual Examination for the National Diploma in Dairying was held at Reading from September 19 to 23, and at Kilmarnock from September 26 to 30. Twenty-three candidates had been examined at Reading, of whom sixteen passed, and eighteen at Kilmarnock, of whom eleven passed.

On the motion of Mr. DUGDALE, seconded by Mr. RANSOME, it was resolved, "That Mr. E. V. V. Wheeler be appointed as the Society's representative Governor upon Childe's School Foundation, Cleobury Mortimer, for a period of five years, commencing November 2, 1904, in accordance with Clause 4 of the scheme for the administration of that Foundation."

Dairy and Produce.

Mr. DUGDALE (Chairman) reported that the accounts relative to the Dairy at the late Show at Park Royal had been submitted to the Committee, and that the net cost had been 191*l.* as against 218*l.* in 1903. The Committee had considered the general question of the Dairy and Produce Department at the Show, which had been raised at the recent Conference with exhibitors of live stock. The Committee thought it right to point out that besides 10*l.* contributed by the Society for the butter test classes the sum of 40*l.* was offered for dairy cows judged by inspection, as well as 41*l.* for butter and 78*l.* for cheese, all of which might be regarded as "prizes offered in connection with the dairy-interest."

The **PRESIDENT** said he had received a personal letter from Lord Rothschild promising a contribution to the Fund of 250*l.* for the Show of 1905, and suggesting that the Society should offer, in the classes of cattle suitable for dairying, Milking prizes by points in addition to Inspection prizes. The breeds suggested were Shorthorns (eligible and not eligible for the Herd Book), Lincoln Red Short-horns, Red Polled, South Devons, Ayrshires, Kerries, Dexters, Jerseys, and Guernseys, with prizes of 10*l.*, 5*l.*, and 3*l.* for each breed, or 180*l.* in all. He (Lord Middleton) proposed to send Lord Rothschild a personal letter of thanks, with a promise that the suggestion he had been good enough to make should receive every consideration. It would, perhaps, be best to refer the matter to the Stock Prizes Committee, for consideration when drawing up the prize sheet for next year. This was agreed to.

Special Charter Committee.

Sir **NIGEL KINGSCOTE** reported as to the re-arrangement of the system of appointing the governing body of the Society with a view to placing it on a representative basis, that the Special Charter Committee had been advised by eminent counsel that this could be best effected by a Supplemental Charter, and the Committee had accordingly instructed the Society's solicitors to draw up a petition for such Supplemental Charter, to include the following points:—(1) That the Members in any district or group of counties should have the absolute power of electing their own representatives on the Council; (2) that there should be a power of co-optation to the Council to the extent of, say, ten Members, so as to ensure representation of any particular branch or industry, scientific men or specialists; (3) that not less than one General Meeting of Members be held in the year—date and place to be fixed by the Council. The Committee would report further on this matter at the next meeting of the Council.

Subscriptions of Members.

Mr. **CORNWALLIS** moved the following resolution, of which he had given notice:—

That the Annual Governors and Members be asked to increase their subscriptions, and that Life Governors and Members be asked to give an annual subscription to the general funds of the Society.

He had never understood why the amount of the subscription on the blank form of application for membership should be limited to 1*l.* He thought that this sum should only be regarded as the minimum subscription. If this was so, they might very soon see an increase in the finances of the Society. Many people subscribed far more than that to their local shows. He thought they should not be content with reducing their expenditure, but should also endeavour to increase their funds, and so secure a double advantage. They could not efficiently maintain the Society's work with only an income of from 6,000*l.* to 7,000*l.*, now received from 9,500 members. They were going to ask for the election of Members by Counties. He did not see why Counties should not be encouraged to vie with one another in the amount of the subscriptions which they contributed to the Society.

Mr. **SANDAY** seconded the resolution, which, after a short discussion, was adopted.

A motion standing in the name of Sir **WALTER GILBEY** for the abolition of the privilege of paying life compositions for new elections as Members after the present year, was referred to the Charter Committee for consideration when drawing up the new Bye-laws that would be necessary under the proposed Supplemental Charter.

The date of the customary General Meeting of Governors and Members held in the Smithfield Show week was fixed for Thursday, December 8, at 11 a.m., and it was decided that the meeting should be made special for the purpose of considering the position of the Society.

WEDNESDAY, DECEMBER 7, 1904.

LORD MIDDLETON (PRESIDENT) IN THE CHAIR.

Present :

Trustees.—Earl Cawdor, the Earl of Coventry, the Earl of Derby, K.G., Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingseote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—H. R. H. Prince Christian, K.G., the Earl of Feversham, the Earl of Jersey, G.C.B., Lord Moreton, the Hon. C. T. Parker, Mr. G. H. Sanday, Sir Jacob Wilson.

Other Members of Council.—Mr. R. C. Assheton, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutchley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, the Hon. A. E. Fellowes, M.P., Mr. S. P. Foster, Mr. W. Frankish, Mr. Hugh Gorrings, the Marquis of Granby, Mr. R. M. Greaves, Mr. R. Neville Grenville, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. H. D. Marshall, Mr. Joseph Martin, Mr. Christopher Middleton, Mr. T. H. Miller, the Rev. D. B. Montefiore, the Earl of Northbrook, Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. F. Reynard, Mr. C. C. Rogers, Mr. Howard P. Ryland, Mr. W. Seoby, Mr. E. W. Shackleton, Mr. A. J. Smith, Mr. E. W. Stanyforth, Mr. R. Stratton, Mr. E. V. V. Wheeler, Mr. J. C. Williams, and Mr. C. W. Wilson.

Death of Viscount Ridley.

The PRESIDENT, in opening the proceedings, said that it was with deep regret that he had to announce the death of Lord Ridley, who had been President during the year that the Show was held at Nottingham in 1888. Lord Ridley had been for many years a Trustee of the Society, and he was a Member of the Council from 1869 to the time of his death. He had been with them at their last meeting, and, though they could see he was ill, the suddenness of his death came to all as a great shock. He had filled with distinction many public positions, and the country at large would deplore his loss. They would always think of

him as an able colleague, ready and willing to give sound advice. They knew how devoted he was to his country home, and, above all, how much he was associated with country life and agriculture. This made him one of those typical men whom they desired to see on the Council. Every one would regret his death as a great loss to the Society, and many would miss him as a true friend.

Election of New Members.

The minutes of the last meeting of the Council, held on November 2, 1904, having been taken as read and approved, the election of fifteen new Members was proceeded with.

Show of 1905.

The PRESIDENT said they had now to resume as special business the consideration of the question of the holding of a Show in 1905. The appeal for funds to enable such Show to be held without further loss to the Society's general funds had been issued on October 18, and so far had resulted in the receipt of 480 promises of subscriptions, which amounted in all to 4,471*l*. In addition, 107 further promises of subscriptions and guarantees had been given under conditions of various kinds, made by the subscribers themselves, that amounted in all to 665*l*. It was for the Council to consider whether, with these figures before them, they would decide to organise a Show next year.

The Earl of DERBY said that he had opened the discussion on this question at the meeting of the Council on October 6 last, when the following resolution was adopted :—

That the Show of 1905 be held at Park Royal in the second week of July, subject to a guarantee fund of 10,000*l*. being raised by subscriptions from Members, exhibitors, and others towards defraying the expenses of the Show.

Under these circumstances, he hoped the Council would allow him to ask them to consider whether, in their view, the conditions contained in the

resolution had been complied with. He found himself in the unpleasant position of being obliged to ask whether, if the circumstances should be such that nothing could be done to guarantee the full expenses of the Show, viz., up to the 10,000*l.* named, they would not have to look the facts in the face and abandon their Show for one year. He felt as deeply as any one in the Society their position in connection with breaking the continuity of the Shows. The only occasion when such a course had been taken was at the time of the cattle plague in 1866, when no Show was held. It seemed to him a very sad state of things that they should have to consider the adoption of such a course now. For himself, he had no misgivings as to the future of the Society, if they could pull themselves together. He thought there were many whose minds would be made up in their favour, if they took a calm and dispassionate view of the situation.

He did not propose to go into figures which had been read and discussed on former occasions. The issue before them was a simple one: Were they or were they not justified in holding a Show next year if the conditions were not complied with for which the guarantee was asked? With very great reluctance he asked if the Council were determined to go forward notwithstanding. He did not intend to propose any negative motion on this question, and he only desired to raise his voice against any proposals to hold a Show next year unless the necessary money for the purpose could be obtained. The Society must look facts in the face. He believed that a turning-point in the life of the Society would result from their pulling themselves together, and by giving effect to alterations in their Charter so far as possible. With these feelings he desired to enter a protest against going forward with this matter, and to express his very strong objection against holding a Show in 1905 unless the guarantee asked for by the Council were complied with.

The Marquis of GRANBY said he believed that the course proposed by Lord Derby was the most practical one to pursue, and he, for one, would

support it. It was perfectly true that it might be said that 5,000*l.* was sufficient to enable the Society to hold a Show next year; but if it was not, the terms of the resolution passed in October were specific, and the Council ought to feel bound by them. If the Show should not be held next year, this, no doubt, would cause dissatisfaction in some quarters, and the Society might in consequence lose a certain number of Members. He did not, however, think that this was an absolute fact. On the other hand, he believed it would do far more to create a feeling throughout the country that the Council were acting in the very best interests of the Society by doing as suggested and not holding a Show next year. By this means they would be able to reduce expenses, and probably in the subsequent year they might have a sufficiency of income to hold a Show, quite irrespective of the fact of whether it paid its way or not. But they should not go forward blindly to hold a Show next year and afterwards find themselves more deeply in debt than they were at the present moment. If they abandoned the Show next year, and placed themselves in a thoroughly sound financial position, they would, so far from minimising the belief in the stability and real value of the Society, only heighten and improve its position. He desired to support Lord Derby's proposal, as he thought it would be the wisest course to adopt.

Mr. SANDAY sympathised very much with the remarks made by Lord Derby. He did not wish to advocate the holding of a Show without a sufficient guarantee to meet any possible loss; but he believed—and there were a great many others of the same opinion—that in fixing the sum of 10,000*l.* as the guarantee required, they had named too high an amount. He felt the great importance to the Society of holding a Show in 1905, and he himself would be anxious to go forward with the Show if in the course of another month a sufficient sum in the opinion of the Council were received to meet the possible losses. He quite agreed that, in view of the resolution passed in October, it would be imprudent with only 5,000*l.*, half the sum named, to

decide definitely that day to hold a Show; but he did feel that if a sufficiently large sum were obtained they would be in a position to say that the Show should be held.

Mr. RANSOME said that a guarantee of 10,000*l.* had been asked for so that there should be no loss in connection with the holding of the Show in 1905. He was of the opinion that they had not quite come to the end of what would be promised towards this sum. This was the idea he gathered upon going round to the exhibitors of implements at the Cattle Show now being held at Islington. With regard to last year's Show, the loss over it was 7,000*l.*, and for the Show of 1905 they had already promises of over 5,000*l.*, and there was no probability that the Society would lose more than 7,000*l.* next year. It had already been arranged that reductions should be made in connection with the 1905 Show, notably in respect of the advertising, and he had no doubt that a saving of at least 1,500*l.* could be effected under this head for the 1905 Show. He had no personal interest to serve in advocating the holding of the Show in 1905, and was only speaking in what he believed to be the best interests of the Society, for he thought it would be a very unfortunate thing if the Society had a break of even one year in connection with the holding of its Shows. The Society already possessed a site upon which a great deal of money had been spent, and he felt that the promises of over 5,000*l.* which they had would cover any loss on a Show next year. London was different from provincial towns, because in the latter large employers of labour could be called upon to give their workpeople a half-holiday, and sometimes they also paid for them to visit the Show. It therefore seemed very desirable that Londoners should have an opportunity of attending their Show when there was a public holiday, as would be the case if Whit-Monday were included in the Show-week of 1905. For these reasons, and because they had not got to the end of their promises of subscriptions, he was against giving up the idea of holding a Show in 1905, until the matter was completely threshed out.

Mr. PELL asked whether he was right in assuming that it was intended to organise a Show with only 5,000*l.* guaranteed. In his opinion it would be a disastrous thing to attempt an enterprise like the Show with inadequate means, and ask the guarantors to sink their money. He suggested that they should stand to their guns, and if they could get 10,000*l.* have a Show, but if they could not raise that sum they should not have it.

Sir NIGEL KINGSCOTE was extremely sorry to have to differ from Lord Derby, as they all knew the great assistance he had rendered to the Society, but he did feel most strongly that if the Show were abandoned without further effort on the part of the Society considerable harm would be done. Things went very fast in these days, and if they had no Show for two years the Society would lose a large number of Members, and it would put off exhibitors of stock and implements from their Shows. Buyers came from abroad and also from the Colonies, and they chose their time so that they could attend the Society's Shows. The exhibitors of live stock would lose by not having the foreigners and colonials at the Royal Show. If the Members pulled together, and more especially if the Life Members who had been on their books for a good many years came to their help, matters would improve. With regard to the Guarantee Fund even if they did not hold a Show, they must still have expenses. They had up to the present 5,000*l.* guaranteed, and if between this and January they obtained further sums he was of opinion that they should hold a Show, as he could not help thinking that if they gave up the Show it would be giving up the Society altogether.

Mr. CORNWALLIS observed that he should like to know exactly how matters stood. To him it appeared that there was really nothing inconsistent between Lord Derby's proposal and that of Mr. Sanday. If he were asked to vote that day "Aye" and "No" on the promises of 5,000*l.* he should certainly vote with Lord Derby. But if between now and next January the Society had received

an amount which would warrant their holding a Show, he should certainly hold up both hands for a Show to take place.

The Rev. D. B. MONTEFIORE said that of course the present situation of the Society was one of much anxiety. For himself, he thought that it would be absolutely dishonest not to hold a Show next year, as he believed that quite three-fourths of their Members subscribed because the Society held a Show each year. If no Show were held they would lose a great many of their Members, for the Show was the very essence of the Society. They should take their Members entirely into their confidence; and he would suggest that the Members of the Society should be asked for what purpose they would like their subscriptions put—viz., to carry on the general work of the Society, or for Show purposes. People were asking why they were appealed to for money to carry on the Show. He protested against the 6,000*l.* which the Society drew from its Members being expended upon every other work except the Show. He was of the opinion that if their Members were appealed to on the subject, they would be in favour of 3,000*l.* of the 6,000*l.* being spent on administration and scientific work, and 3,000*l.* in connection with the Show. They had over 5,000*l.* promised towards next year's Show, and if they were to spare 3,000*l.* out of their 6,000*l.* they would thus, with their guarantee, have over 8,000*l.* for a Show in 1905. He, however, did not believe that they would lose such a sum as 8,000*l.* over next year's Show.

The Earl of JERSEY observed that they must not think of honesty to their Members if they ran the risk of being dishonest to their creditors. He thought Lord Derby's argument was sound. It was the view of the Council that 10,000*l.* was the least sum that would enable the Show to be held; but they had not got that sum. Out of the 10,000 Members appealed to only about 500 had responded. That did not look as if the great body of the Members were intent on having a Show. Were they likely, if the question of having a Show or not were

postponed, to raise the other 5,000*l.* or whatever other sum the Council might think necessary? He could not approve a proposal which might land the Council in further difficulty, but he should support Lord Derby's proposal because he thought it was a sound one.

Sir JACOB WILSON said that the duty of the Council at this moment was not only to try and get new Members, but to maintain the membership they already had. If the Show were abandoned next year, there were hundreds of Members who would take the opportunity of withdrawing from the Society this year and never come on again. He thought that, considering the pros and cons, and looking to the future of the Society, they must maintain the Show for next year, and in that way maintain their membership.

The Earl of FEVERSHAM said although he was not originally in favour of the change in establishing themselves as a fixed Show, still he thought there were very strong reasons assigned for holding a Show next year. He thought that it would be a very great disappointment to the large number of subscribers to the Society, and to those who had put down their names on the subscription list, if a Show were not held in 1905. They could not, of course, now deal with what might be the result of the holding of a Show, but as he understood that 7,000*l.* quite covered their losses last year, and they had now 5,000*l.* already subscribed as a guarantee for the following year, he could not help thinking that there would be no great difficulty in raising the balance. He was of the opinion that it would be desirable that a Committee should be formed to inquire into all the circumstances with respect to the future of the Society. He could never contemplate a rotatory Show again unless the Society quite understood that the County Show in the district in which it might be held would be merged with the "Royal." Wherever they went the Society should have the County Show to join them. He was of the opinion, from what he had heard that day, that there were sufficient grounds for hoping that the Society

would hold a Show next year, which he trusted would be successful, and one that would not be too large a tax upon the resources of the Society.

Earl CAWDOR expressed the opinion that the Council should not tie their hands that day on the question of holding a Show, and that it would be wiser policy not to come to any conclusion at all for the present. With regard to the amount required for the holding of the Show next year, in his opinion the time should still be extended in order that they might obtain the requisite sum. It seemed to him almost unanswerable that the Council should not tie their hands that day. If they closed the subscription list at once, they would be in a position of going to the General Meeting of the Members on the following day with a suggestion that at that meeting of the Council a decision had been come to not to hold a Show next year. He, therefore, suggested that they should leave the matter open until next January. He was of the opinion that it would be no disadvantage if it were known to their Members that the matter was still hanging in the balance.

Sir WALTER GILBEY entirely supported the opinions which had been expressed by Lord Cawdor. He did not desire to minimise the fact that the Council had made mistakes. He hoped, however, that the Council would now exert themselves in the best interests of the Society, and that the question before the Council would be adjourned until after the General Meeting of Members, to be held on the following day.

Mr. STRATTON said that, as the original mover of the resolution passed by the Council on October 6, he should like to state that it was then his idea that 5,000*l.* would be sufficient for the purposes of the Show; and, in fact, he had put that sum down on the original resolution. It had, however, been suggested to him that they should ask for the sum of 10,000*l.*, though he did not anticipate that they would get so much. He believed that it would be a very great mistake not to hold the Show next year, as he did not think the Society's position financially would be improved by abandoning the Show for a year. On the contrary, he

thought they would be worse off; for if they had a break in their Shows it was a great question whether they could re-establish the Society in a good position again. The Society was not in any case in such a bankrupt position as had been suggested. He should, therefore, like this matter to stand over for another month, for he thought that it was pretty unanimously agreed that the Society ought to hold a Show next year.

After some further discussion, Mr. CORNWALLIS formally moved the following resolution:—

That a final decision as to the Show in 1905 be postponed until a meeting of the Council to be held in the second week of January, 1905, in the hope that further sums by way of subscriptions or guarantees will meanwhile be forthcoming from members, exhibitors, and others, which in the opinion of the Council will be sufficient to warrant the Society in organising a Show for 1905 without further loss to its general funds.

The Earl of COVENTRY, in seconding this resolution, said that they found themselves in a serious dilemma, and he could quite understand the position which Lord Derby had taken. He thought that if a Show were not held next year it would be most disastrous to the Society. He was quite sure a very large number of Members would withdraw, and he did not think the Society would ever recover itself.

The Earl of DERBY said he would like to say a few words before any vote was taken. He did not intend to make any motion, so that, therefore, there was nothing except the original proposal before the Council at that moment. He wished to call attention to the circumstances under which the matter had been brought before the Council on the previous occasion in October. It was then decided to hold a Show, subject to a Guarantee Fund of 10,000*l.* being raised. As that guarantee had not been raised, it followed, on the other hand, that the Show should not be held. As to the particular sum of 10,000*l.*, or any other sum, he had no special view, provided it were sufficient to cover all their expenses which could possibly accrue, such as the loss arising from a wet week, or from other possible difficulties. So

far as the postponement of a decision to the month of January was concerned, he only desired to point out that he raised the question—and from the discussion that had arisen he thought he had done so usefully—because he felt they should not go forward recklessly. On the other hand, if they could go forward with a sufficient guarantee against every possible contingency, he thought they were all agreed that they should do so.

The PRESIDENT said he quite agreed with Mr. Cornwallis's resolution. He was of the opinion that if the matter were left in this manner more subscriptions would come in. Every day he heard of people intending to subscribe, but who were waiting to see what others were doing.

After some further conversation, the resolution was put from the Chair, and was carried unanimously.

The Reports of the various Standing Committees were presented and adopted as below :—

Finance.

Sir NIGEL KINGSCOTE (Chairman) reported that the accounts for the month of November, 1904, showed receipts amounting to 1,430*l.* 15*s.* 9*d.* (including 925*l.* 15*s.* 6*d.* special contributions), and expenditure amounting to 556*l.* 17*s.* 11*d.* Accounts amounting in all to 1,871*l.* 2*s.* 2*d.* had been passed. The receipts and expenditure for the Society's Show at Park Royal, held last June, had been submitted to and examined by the Society's Accountants and by the Auditors appointed by the Members, and showed an actual loss to the Society's funds of 6,920*l.* 9*s.* 10*d.*

Sir NIGEL KINGSCOTE further reported that the Finance Committee had caused to be circulated with the summons to Members to the General Meeting the following Memorandum as to the actual financial position of the Society, which at the last meeting the Council had requested them to draw up :—

Memorandum by the Finance Committee.

1. It will have been apparent to the Members from the Balance-sheet for 1903, submitted at the Anniversary General Meeting held last May, that

the Society had to commence its operations for the current year without any free assets which would be immediately available for realisation in the event of the Society's operations for 1904 resulting in a loss, as has unfortunately proved to be the case.

2. It was stated in the Report presented to the Members on December 10, 1903, that "the adverse result of the first year's Show at Park Royal ought not, in the opinion of the Council, to deter the Society from perseverance in the new enterprise upon which it has embarked, and they have therefore decided to hold a Show in 1904 upon the same general lines as in 1903." But as the holding of this Show of 1904 has resulted in a further cash loss of 6,920*l.*, it has become necessary for the Society to consider carefully, before the organisation of another Show is entered upon, how the necessary expenses and the possible future losses are to be met.

3. The total INCOME of the Society from Annual Subscriptions was 6,291*l.* in 1903, and will be somewhat less in 1904. A sum of 6,000*l.* is therefore all that can be relied upon at present to meet the cost of administering the Society and providing the whole body of 9,500 Members (including 3,500 Life Members) with their privileges.

4. The total EXPENSES of the Society, other than those directly connected with the holding of the Annual Show, but including the cost of organising at Hanover Square the preliminaries of the Show (only a part of which has heretofore been debited to the Show Account), were in 1903, 10,200*l.*, of which 9,055*l.* appears in the "Ordinary" Income and Expenditure Account, and 1,145*l.* in the Show Account. It is important in the best interests of the Society that the several departments of its public work should be continued, so far as funds will permit. The Council see their way to effect various economies by reductions of the salaries of the higher officials, savings in clerkage, &c., a diminution of the Journal, rearrangements in the Chemical and Veterinary Departments, and letting off part of Harewood House, which will bring down the Head Office expenses in the future by a sum which, when all the new arrangements have been completed, and if the Society's debts can be paid off, will be about 2,200*l.* a year, thus reducing the total cost to 8,000*l.* a year. The adjustment of the total cost as thus reduced, which seems to the Committee, after careful consideration, to be fair as between the General Account and the Show Account, is 6,000*l.* to the former (including the Journal and all the scientific departments) and 2,000*l.* to the latter.

5. Thus, though the Society might in the future be able to carry on all its departments of public work other than the Shows, out of the income which it at present receives, it could not with such an income organise a Show, nor could it, having no longer a Reserve Fund of its own, or the considerable

financial assistance which it used to receive from the localities formerly visited, bear the money loss which the holding of a Show must now almost certainly entail from the probable receipts falling short of the necessary expenditure.

6. The remedy seems to lie (1) in a considerable voluntary increase of annual subscriptions by Governors and Members to enable the Society to continue all its operations; (2) in the building up of a Reserve Fund to meet the possible losses from the holding of the Shows (wherever held).

7. The financial position of the Society at the end of this year will be as follows: In order to pay for the losses on the 1904 Show and its current obligations up to the end of this year the Council have (1) arranged with the Society's Bankers to continue until July 31, 1905, the loan of 12,000*l.* granted by it in 1903 on security of the Harewood House Debenture Stock held by the Society; (2) obtained from the Bank a further temporary loan, under the guarantee of certain of the Trustees, amounting now to 3,000*l.*; (3) borrowed a further 7,500*l.* on the Harewood House property. The last-named obligation is capable of being dealt with at a later stage: but it is obvious that within the next few months the Society must, independently of its other difficulties, find some means of repaying to the Bank the 15,000*l.* which it has advanced, and on which interest at 4 per cent. is running against the Society.

8. One way of doing this would of course be by the sale of the Park Royal estate; but the Finance Committee cannot take the responsibility of recommending this, in view of the fact that Park Royal is a rapidly improving property of which the full benefit cannot be reaped by the Society if it should have to be disposed of before the expiry, seven years hence, of the right of pre-emption at 50 per cent. advance on the purchase price, retained by the original vendor when the property was bought in 1901. Moreover, the sale of Park Royal might leave the Society without any place to hold a Show except by the invitation and with the financial assistance of particular localities.

9. The Finance Committee are naturally anxious, on general grounds, that the Society's debts to its Bankers and others should be paid off as soon as possible; but at the same time they think it important that the question of the future Shows of the Society should not be now prejudged, but should be left for final settlement in the hands of the new Council directly representative of the Members, to be elected as soon as the Supplemental Charter now being asked for has been granted.

10. The Committee regard it therefore as of the utmost importance that the sale of the Park Royal estate should not at this moment be forced upon the Council, as would appear to be unavoidable to pay the Society's debts unless the Members will come forward with further financial assistance. They

suggest therefore that Members should be asked (A) to make contributions towards paying off the Society's debts, particularly the temporary loan of 15,000*l.* obtained from the Bank, and (B) to increase their annual subscriptions for the future to such an amount as they feel disposed, to enable the Society to have a sufficient assured income to continue the various departments of public usefulness which it has carried on for so many years.

(Signed)

NIGEL KINGSCOTE, *Chairman.*

For and on behalf of the

Finance Committee.

13 HANOVER SQUARE, W.

November 14, 1904.

The Society had already received in reply to the suggestions contained in this circular contributions amounting in all to 1,238*l.* 17*s.* from 167 Governors and Members towards paying off the Society's debt; and had also been promised increased subscriptions in future years, ranging from 25*l.* to 1*l.*, from sixty-six Life and forty-two Annual Members, amounting in all to 196*l.* 4*s.* per annum.

The Committee recommended that a list of the donations and subscriptions thus received, and also of the subscriptions to the Show Fund of 1905, should be printed and circulated.

House.

Sir NIGEL KINGSCOTE (Chairman) reported the steps taken with a view to letting off a portion of the Society's house. In consequence of the death of Lord Ridley, he (Sir Nigel Kingscote) was now the sole holder of the 13,100*l.* Harewood House Debenture Stock, which had been held by Lord Ridley and himself under resolutions passed by the Council on March 6, 1895, and subsequent dates, "for the benefit of the Society's general funds." The Committee recommended, therefore, the formal transfer of the 13,100*l.* stock in question out of the name of Sir Nigel Kingscote, as survivor in joint account with the late Lord Ridley, into the names of Sir Nigel Kingscote, Earl Cawdor, and Sir John Thorold, and that the seal of the Society be affixed to the new certificates.

Journal.

Sir JOHN THOROLD (Chairman) reported that the contents of Vol. 65

of the Society's Journal had been settled.

Chemical and Woburn.

Mr. BOWEN-JONES (Chairman) presented the following Report on the Chemical Department of the Society, and recommended that the revised scale of fees for analyses, &c., to be charged to Members, should come into force on January 1, 1905 :—

Report of Chemical Committee.

Chemical Department.—The importance of the work of the Chemical section seems to fully justify its continuation without serious curtailment.

In order that the cost to the Society may be clearly defined, the following arrangement with Dr. Voelcker, already sanctioned by the Council on November 1, 1904, will need to be endorsed on his existing agreement with the Society :—

That in future a fixed salary be given to Dr. Voelcker, as Consulting Chemist to the Society, for reports and further information required arising out of his analytical work or otherwise; for research investigations conducted for the Society; for expert supervision of the experimental work at the Woburn Farm and Pot-culture Station; also for the conduct of research work under the Hills' Bequest. The salaries of all assistants, both at his own Laboratory and at the Pot-culture Station, to be paid by Dr. Voelcker. Analyses for members of the Society to be undertaken at his own expense by Dr. Voelcker, who will take the fees on a scale, to be approved by the Committee, not exceeding the present charges. [A schedule of the proposed reduced fees, as revised by Dr. Voelcker, was appended to the Report, and will be found on page III of the Privileges of Membership at the end of this Volume.]

The salary for Dr. Voelcker	£
to be fixed at	750
per annum, from which a charge of 200 <i>l.</i> will be incurred by him for the qualified assistant, &c., now at the Pot-culture Station	200
Thus making Dr. Voelcker's personal remuneration	550

Which is a reduction of Dr. Voelcker's salary, and consequently in the cost of the Department of 150*l.*, the former cost being 700*l.*

The Hills' Bequest will contribute towards the payment made to Dr. Voelcker of	750
A sum of	150
Thus reducing the charge on the Society to	600

The annual expenditure on behalf of the Hills' Bequest on the basis of a payment of 150*l.* per annum from its revenue to Dr. Voelcker, as above, will be about per annum . . . 238

While the income derived £ £
from the 8,126*l.* 8*s.* 2*d.* 2*½* per cent. Consols. in which the bequest is invested amounts to 203

So that further charges will be incurred by the Society for making good the deficiency of income over expenditure from Hills' Bequest of about 35 <i>l.</i> per annum after the year 1907, there being at the end of 1903 an accumulated balance of 189 <i>l.</i> 3 <i>s.</i> 1 <i>d.</i> to the credit of Hills' Bequest	35
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Also during the next sixteen years for writing off the capital cost of the Pot-culture Station a sum per annum of	50
Making the total nett estimated annual expenditure in the Chemical section	685

As compared with 764*l.*, plus 50*l.* for Pot-culture buildings = 814*l.*—a reduction in the future of say 130*l.* per annum.

This is of course subject to the Experimental Farm and Pot-culture Station at Woburn, and the work of the Hills' Bequest, being continued.

Woburn Farm.—The allowance of 500*l.* per annum recently given by the Duke of Bedford for the Woburn Experimental Farm has proved insufficient to meet its requirements: the capital having become reduced and being now insufficient for working the Farm. The annual cost of working the Farm is from 600*l.* to 700*l.*

The Duke of Bedford has, by authority of the Council, been recently communicated with, and has generously made a further contribution of 700*l.* to provide the Farm with capital, and has promised to increase his annual subsidy from 500*l.* to 600*l.* per annum.

Pot-culture Station.—The Pot-culture Station belonging to the Society, in which the Society's and the Hills' Research Experiments are conducted, cost the Society in outlay for its establishment, 1,226*l.* 12*s.* 4*d.*, of which sum 426*l.* 12*s.* 4*d.* has been written off, leaving 800*l.* remaining—which, at 50*l.* per annum, will be completely written off in sixteen years.

The annual expenditure of this department exceeds the revenue obtained from the Hills' fund by about 85*l.* a year. Although there is a sufficient accrued credit balance in hand to meet the present scale of expenses until the end of 1907, after that period it would be necessary to provide about 85*l.* per annum for this work, as shown in the estimated annual expenditure by the Society as shown above.

(Signed) J. BOWEN-JONES,
Chairman.

13 HANOVER SQUARE, W.
November 29, 1904.

With reference to the Duke of Bedford's generous donation of 700*l.* to the general funds of the Woburn Experimental Farm, and the increase

of his yearly contribution by 100*l.*, viz., from 500*l.* to 600*l.* per annum, the Committee recommended that the best thanks of the Council be conveyed to his Grace for his generosity in this matter. A resolution had been received from the Leicestershire Chamber of Agriculture (whose Members had visited the Farm and Pot-culture Station during the past season) expressing high appreciation of the value of the work carried on at the farm, and their hope that it would be continued in future.

Mr. BOWEN-JONES, in moving the adoption of this Report, said that it was proposed to reduce the cost of the Chemical Department by 130*l.* per annum at the present moment, and by a further sum of 50*l.* a year when the capital cost of the Pot-culture Station had been written off. Dr. Voelcker had agreed to a reduction in his salary, and, in addition, to reduce considerably the fees hitherto charged to Members for chemical analyses. He now moved that the reduced scale of fees be adopted. It was hoped that the reduction in fees would increase the number of samples sent for analysis to their Consulting Chemist. But whether this would be so or not, he believed that Members of the Society would take advantage of Dr. Voelcker's expert knowledge and still continue to send their samples to him, in preference to going to the public analysts employed by the County Councils. Perhaps hitherto the fees charged might have deterred some from doing this, but the new fees were nearly as low as those of the county authorities, who allowed the analyses to be made at low fees at a very considerable cost, the money for which had to come out of public funds.

He could not sit down without alluding to the munificent donation which the Duke of Bedford had so generously and promptly made to the Society. His Grace had replaced the depleted capital for conducting the Woburn Experimental Farm, and had promised to increase his present annual grant from 500*l.* to 600*l.* He suggested that a special letter of thanks, to be signed by the President, should be sent to the Duke of Bedford. He (Mr. Bowen-Jones) desired to point

out, in connection with the work of the Chemical Department since the Woburn Farm began nearly thirty years ago, that half the cost of the Chemical Department of the Society had been borne by successive Dukes of Bedford, and he thought it would be a monstrous thing to contemplate the abandonment of that branch of the work of the Society. He should further like to point out that the cost of the Chemical Department to the Members was a little over 1*s.* 6*d.* per head, and he did not think that that would be considered too large an amount to contribute to a branch of science which was of such importance to the agriculturists of this country.

Botanical and Zoological.

Mr. WHEELER (Chairman) reported that the Annual Reports for 1905 of the Consulting Botanist and Zoologist had been passed for publication in the Journal (see pp. 258 and 273). Other matters relating to grass experiments and experiments on the eradication of wild onions had been dealt with.

Veterinary.

The Hon. CECIL PARKER (Chairman) presented the Committee's recommendation for the continuance for 1905 of the allowance of 200*l.* per annum to the Royal Veterinary College in consideration of the veterinary privileges granted to Governors and Members of the Society.

Stock Prizes.

Mr. SANDAY (Chairman) reported that offers of prizes by Breed Societies had been provisionally accepted, subject to the Show of 1905 being held. Suggestions by Lord Rothschild as to Milking Prizes had been laid before the Committee, and they recommended that such suggestions be accepted in principle, subject to the settlement of details.

Implement.

Mr. FRANKISH (Chairman) reported the receipt of a notification as to the holding of an International Congress of Agricultural Machinery in connection with the Liège Exhibition of 1905.

Showyard Works.

Mr. CRUTCHLEY (Chairman) reported that various matters had been

laid before the Committee, and instructions given thereon.

Selection.

Sir JOHN THOROLD (Chairman) presented the recommendations of the Committee with regard to the filling up of two vacancies on the Council in accordance with the terms of Clause 6 of the Charter. They recommended that for the ensuing year they be constituted of the President, the Chairmen of each of the Standing Committees, Sir Walter Gilbey, Sir Jacob Wilson, and Mr. Stratton, and the three following new Members to replace those retiring by rotation: Lord Wenlock, Mr. Assheton, and Mr. Harrison.

On the motion of Sir JOHN THOROLD, seconded by Sir NIGEL KINGSCOTE, Mr. Ernest Mathews, of Little Sharelodes, Amersham, Bucks, was elected a Member of the Council in the room of the late Mr. Terry; and on the motion of Mr. WHEELER, seconded by Mr. SANDAY, Mr. A. P. Turner, of The Leen, Pembridge, Herefordshire, was elected a Member of the Council in the room of Lord Middleton, appointed a Trustee.

Education.

Lord MORETON (Chairman) reported that the Regulations and Syllabus for the Examinations in Agriculture and Dairying for the year 1905 had been revised by the National Agricultural Examination Board, and the Committee recommended that they be now issued.

On the motion of Lord MORETON, seconded by Mr. WHEELER, Mr. Bowen-Jones and Sir Ernest Clarke were re-elected as the Society's representatives upon the National Agricultural Examination Board for a period of three years from January 1, 1905.

Dairy and Produce.

Mr. DUGDALE (Chairman) presented a provisional recommendation as to prizes for Butter, Cheese, Cider and Perry, and Wool at the Show of next year.

Supplemental Charter.

The PRESIDENT reported that the Society's Solicitors had been instructed to draw up a draft Petition and Supplemental Charter in accordance with the terms of the following resolution of the Committee:—

"That the Petition for the revision of the Charter be directed mainly to obtaining authority to alter the method of election of the Council, and for Governors and Members to vote by proxy or ballot or voting papers, and to hold representative meetings, and to limit the compulsory General Meetings to one Annual Meeting."

It was arranged that the Council should adjourn, after the conclusion of the remaining formal business, until the following morning, Thursday, December 8, 1904, for the purpose of considering and, if approved, of passing for submission to the General Meeting, the Petition and Charter drawn up in accordance with the preceding resolution.

Standing Committees for 1905.

The following Standing Committees were appointed for 1905: Finance, House, Journal, Chemical and Woburn, Botanical and Zoological, Veterinary, Stock Prizes, Judges Selection, Implement, General Show, Showyard Works, Selection, Education, and Dairy and Produce. The present Members of the various Standing Committees were (with some exceptions) re-appointed to those Committees. Mr. A. P. Turner was added to the Chemical and Stock Prizes Committees; Mr. Christopher Middleton to the Botanical and Implement Committees; the Rev. D. B. Montefiore to the Botanical Committee; Mr. Ernest Mathews to the Stock Prizes and Education Committees, and Mr. Cornwallis to the Showyard Works Committee.

Miscellaneous.

A letter was received from the Royal Commission for the St. Louis Exhibition stating that a Gold Medal had been awarded to the Society for its exhibit in Class 83.

THURSDAY, DECEMBER 8, 1904.

LORD MIDDLETON (PRESIDENT) IN THE CHAIR.

The draft of a Petition to His Majesty The King in Council for a Supplemental Charter, with the terms of the Supplemental Charter appended, was read and explained by Mr. Arthur Clarke, of the firm of Messrs. Garrard, James & Wolfe, Solicitors to the Society; and after

some general discussion, it was resolved unanimously, on the motion of the Earl of DERBY, seconded by Mr. W. HARRISON, that the draft Petition be approved by the Council, and that the Seal of the Society be affixed thereto when the Petition had been passed by the General Meeting.

Proceedings at Half-yearly General Meeting of Governors and Members,

HELD IN THE LARGE HALL OF THE ROYAL MEDICAL AND
CHIRURGICAL SOCIETY, 20 HANOVER SQUARE, LONDON, W.

THURSDAY, DECEMBER 8, 1904.

LORD MIDDLETON (PRESIDENT) IN THE CHAIR.

Present:

Trustees.—The Earl of Coventry, the Earl of Derby, K.G., Sir Walter Gilbey, Bart., Colonel Sir Nigel Kingseote, G.C.V.O., K.C.B., Sir John H. Thorold, Bart.

Vice-Presidents.—H.R.H. Prince Christian, K.G., the Earl of Feversham, the Earl of Jersey, G.C.B., Lord Moreton, the Hon. Cecil T. Parker, Mr. George H. Sanday, and Sir Jacob Wilson.

Other Members of Council.—Mr. R. C. Assheton, Mr. J. Bowen-Jones, Lord Brougham and Vaux, Mr. F. S. W. Cornwallis, Mr. Percy Crutehley, Lt.-Col. J. F. Curtis-Hayward, Mr. Alfred E. W. Darby, Mr. J. Marshall Dugdale, the Hon. A. E. Fellowes, M.P., Mr. S. P. Foster, Mr. W. Frankish, the Marquis of Granby, Sir Gilbert Greenall, Bart., Mr. R. Neville Grenville, Mr. William Harrison, Mr. Robert W. Hobbs, Captain W. S. B. Levett, Mr. Joseph Martin, Mr. Christopher Middleton, Mr. T. Horrocks Miller, the Rev. D. B. Montefiore, the Earl of Northbrook, Mr. Albert Pell, Mr. W. A. Prout, Mr. J. E. Ransome, Mr. Frederiek Reynard, Mr. C. Coltman Rogers. Mr.

Howard P. Ryland, Mr. William Seoby, Mr. E. W. Shaekle, Mr. E. W. Stanyforth, Mr. Garrett Taylor, Mr. E. V. V. Wheeler, Mr. J. C. Williams, and Mr. C. W. Wilson.

Governors.—The Hon. F. G. Wynn, Mr. W. F. Holt-Beever, Mr. G. Norris Midwood, Colonel Henry Platt, C.B.

Members.—The Marquis of Winchester, Sir Algernon W. Legard, Bart., Sir Oswald Mosley, Bart., Sir Richard D. Green-Price, Bart., Sir Henry M. Vavasour, Bart., Lt.-Col. Sir Henry C. Wilkinson, K.C.B., Messrs. B. St. John Aekers, Charles R. W. Adeane, D. T. Alexander, W. E. G. Atkinson, Algernon S. Ayre, John Barker, A Barlow, John Bell, M. L. Blamey, E. Bobane, Rev. C. H. F. Broeklebank, Messrs. H. Broeklebank, W. Broomhall, E. Broughall, H. Bultitaft, Roland Burke, F. A. Channing, M.P., George Coombe, R. P. Cooper, William Cooper, S. Copeland, Major Craigie, C.B., Messrs. J. R. Crawley, J. J. Cridlan, F. J. K. Cross, T. A. Dickson, A. F. Milton Druee, S. B. L. Druee, E. G. Duleken, G. H. Evans, J. Talbot Fair, W. Fitzherbert-Broekholes, J. Douglas Fletcher, Colonel W. H. Foster, Messrs.

Howard Frank, John Golding, William Graham, E. O. Greening, H. J. Greenwood, Henry Grinling, Pereival Harter, W. M. Haywood, John Hill, J. J. Hornby, John Hughes, R. H. P. Hutcheson, Surg.-Lt.-Colonel J. Ince, M.D., Messrs. Samuel Kidner, Cyprian R. Knollys, Rev. Cecil Legard, Messrs. R. A. Lister, F. A. Cavendish Macdonnell, Colin McIver, John McLaren, D. Maclellan, J. G. Mair-Rumley, Alfred Mansell, Charles Marriott, J. H. Master, A. H. H. Matthews, J. Maxwell, Thomas May, W. A. May, T. D. Milburne, W. J. Towers Minors, W. Moat, John Neilson, G. F. North, J. Sturley Nunn, Captain W. E. F. O'Brien, Mr. C. F. Paddison, Professor J. Penberthy, Messrs. W. Perkins, Claude M. S. Pilkington, T. F. Plowman, George H. C. Powell, J. E. Rawlence, J. R. Rawlence, Clare Sewell Read, A. Roger Rowden, Harold Sessions, F. W. Silvester, H. M. Simmons, Dr. B. Skälweit, Messrs. A. C. Skinner, Henry Smith, Sanders Spenceer, A. W. Stanton, Thomas Stirton, C. Harris Stratton, C. Howard Taylor, J. Herbert Taylor, C. W. Thompson, C. W. Tindall, Lawrence C. Tipper, E. R. Berry Torr, J. de C. Treffry, E. Trimen, James G. Unite, Eldred G. F. Walker, Dr. Herbert Watney, Messrs. James Watt, Henry Webb, Jonas M. Webb, J. M. White, T. P. Wilkes, W. F. Wilson, Leslie S. Wood, Montague Wootten, &c.

The PRESIDENT, in opening the proceedings, said he had pleasure in welcoming so many Members of the Society at the meeting that morning, and he hoped they would get through the various items of the business in a satisfactory manner. He would ask the Secretary to read the Report from the Council, printed copies of which were in the hands of the Members present.

The SECRETARY then read the principal paragraphs in the Report of the Council for the past half-year (see page 228).

Adoption of Report.

The PRESIDENT, in moving the adoption of the Report, said it would be seen that the Council of the Society

were desirous of meeting a generally expressed wish, and were proposing a Petition for a Supplemental Charter. This proposed Petition would, at a later stage, be explained to the Members present by the Society's Solicitor, who had been asked by the Council to prepare it.

Another important part of the Report was the appeal for funds. It would be observed from the Report that the amount of subscriptions promised to date was about 5,000*l.*—only half the sum that had been asked for. The Council would be very unwilling to undertake a Show next year if they could not obtain the sum which they thought was necessary to carry it through without a loss; and unless a sum approximating to 10,000*l.* was reached, he did not think they would be disposed to organise it. He believed the Council were, generally, of opinion that there should be a Show next year, and he, personally, hoped this would be the case. It should be realised that the Society had only 6,000*l.* a year to depend upon, and he thought this a very insufficient sum for a great Society like the "Royal" to do all that it wished to do, and all that it had tried to do. If the Society were to continue its useful work in the future, there would have to be an increase of subscriptions to the Society.

With respect to paragraph 15 relating to the work carried on at their Woburn Farm, he thought that they ought to be very grateful to the Duke of Bedford for coming forward to help them in connection with that most interesting undertaking. His Grace had ever been most helpful in connection with the Society's work at Woburn, and this year had most generously come forward to help them again. He begged to move the adoption of the Report.

The Earl of DERBY, in seconding the motion, said he did so with the confidence that, whatever might be said of the Society at the present moment, and whatever might be the feeling of some of the Members, and especially those residing at a distance, it was a Report which could be submitted to a fair-minded body of men

such as those who were present that day, without fear as to its reception. It was a fair statement of facts. Nothing, so far as he knew, had been kept out of sight, and the whole statement was as plain and business-like as it was possible to make it for a meeting of that kind. There was no doubt that for some years past the finances of the Society had not been so satisfactory in relation to the Shows as they were in earlier days. He desired to dispel from the minds of some of those present that the Shows in former times were largely productive of benefit to the finances of the Society, and were a success financially. If they took away the local subscription that was raised in the days of the migratory Shows, the Society was by no means in such a fair sea as was supposed to be the case; and he did not think that it was sufficiently remembered that the present system of the permanent Show, at all events, relieved local Members from the great demands made upon them. That had been entirely left out of sight. But the time had come when the truth must be spoken. They knew that in former times, when the Show was migratory, and when it came to one's own district, one was asked to put one's hand very deeply into one's pocket; but with the holding of a central Show, the local Members had been entirely relieved from this demand. He used that argument for the purpose of appealing to those Members to contribute on the present occasion to the full amount that they would have given locally. There was no use in asking for less than they wanted. He, therefore, asked the Members, if they wanted the Show to go forward, to put their shoulders to the wheel, and to put their hands in their pockets.

It had been decided at the October meeting of the Council to the effect that the Show should be held next year subject to a guarantee of 10,000*l.* being raised, and he was of that opinion still. He did not desire to pin himself to the particular sum of 10,000*l.*, though he thought it the right sum to name. What he meant was that they should not go forward with another Show, and they should

not ask those answerable for the welfare of the Society to organise another Show until they were far more clear of debt than they were at that moment. One thing that had shaken the Society more than anything else was that they had gone forward notwithstanding that they were in debt, and he wished to take his full share with those concerned in the Society's management of the responsibility or blame. It was very difficult to draw the dividing line where bravery ended and where recklessness began; and it must be left to every one's individual conscience to say whether in this case the line had been exceeded. On one hand, it would be a grave matter if it should prove afterwards that, on insufficient grounds, they had abstained from holding a Show; on the other hand, it was not without risk that the Show of 1904 and the year before were held. It was no use looking back. They must deal with the situation as they found it. He had hoped himself that the appeal to their Members might not have been in vain. He had said that perhaps there was a want of confidence in those who ruled over the Society. No one who attended the two conferences with the exhibitors two months ago would be left in any doubt as to that.

There was no doubt that as time had gone on there had been a desire on the part of the country Members to participate in the management of the Society's work, and unless there were as well-attended meetings as on that day, General Meetings were hardly a sufficient means of giving Members more than a very qualifying voice in matters relating to the Council and the management of the Society. He thought that it was a wise thing and a right thing to have done, that the Council should propose the alteration of the Charter to enable their country Members to elect directly those whom they wished to place on the Council in charge of affairs. Technically, he believed it had always been the fact that Members had the power of electing the Trustees, Vice-Presidents, and Council, and, as a rule, the Meetings had always approved of those proposed. Now, the

new system of working out different districts, whatever those districts might be, by giving representation to all parts of the country, whether they had Members in greater or less numbers, would have to be settled under Bye-laws, for which the alteration of the Charter was necessary to start operations. The draft of this new Charter would be brought before them that day. If elective power was given more directly, and Members were able to vote by proxy or in any other way, he hoped and trusted—and he was sure that all concerned in the real welfare of that Society would agree in trusting—that the political element would not in any way come in. He sincerely trusted that they would consider agriculture, and agriculture alone, in the choice of their Council, and that Members, whoever they might be—good men and true—who were ready to work in the interests of agriculture, should be their candidates, and no others.

They had now arrived at the turning point in the Society's history. Were they going to stop, or were they going forward? He had not the slightest doubt what their answer would be. He was sure they would be for the forward policy, for the extension of interest in the various districts, and for a closer connection with the local Societies, so that agriculture might still be looked up to as one of the greatest industries of the country, not as a mere pastime, not as a trade carried on merely because it could not be left, but as a business to be brought up to date, to be carried forward by the aid of science and the diffusion of knowledge, which was one of the great objects of the Society. Agriculture might then still be one of those pursuits and means of occupation of which they might be justly proud, and the Society, though changed in some respects, might still be looked up to with affection by those who had been its former Members. (Hear, hear.)

Mr. H. M. SIMMONS said it was impossible to continue to carry on the "Royal" as at the present time. Let them make a clean sweep; do away with all the experiments; do away with the premises at Hanover Square;

take offices in the neighbourhood at a reasonable rent; hire that room for their Annual Meeting, and appoint a working Secretary at about 400*l.* a year. This would save the Society about 7,000*l.* or 8,000*l.* a year. They could then proceed to pay the Society's overdraft at the bank. Let the Society also sell the Harewood House Debentures if they could find a purchaser. The new Council would then be able to start with a clean slate.

Sir OSWALD MOSLEY said that the very able speech which their good supporter, the Earl of Derby, had just made, was on the lines on which he was sure most of the Members desired information. It had not, however, been made sufficiently clear to them that a re-organisation was going to be made. It would be a very serious thing, indeed, should this great Society close its Show in 1905. Their President had taken office at a serious stage in the Society's affairs, and he felt that it would be a disgrace to a public benefactor like Lord Middleton if they were to close the Show during his Presidency. They were fully aware of the good work done by the Members of the Council, and that some of them had tried to carry the Society's affairs on their backs. It was evident that these noblemen and gentlemen could not carry on the work of the Society unless they appealed successfully to its well wishers, including the farmers, who were the backbone of the Show. Do not let the Society do anything in a rash hurry. There was Park Royal, which was purchased by the Society, the vendor having the right of pre-emption up to 1911. The vendor was now willing, he believed, to buy it back at the increased price originally agreed upon and he did not wonder at this. The Railway Companies had spent very much money in connection with the ground, which had improved its value, and the Society had made Park Royal fit for a Show; and it would be fit for a Show. The Stewards and working Members of the Council had done a great deal of hard work in connection with the showyard. They had got a good ground, and let them stick to it. Let them all try and pull together, and let them understand from the Council

now that they meant to wind up the Council, and start it next year, but without co-optation, on a fresh basis, and increase the annual subscriptions. No one, he thought, would mind giving 2*l.* a year instead of 1*l.*; and there were those who would not object to giving 5*l.*, 10*l.*, or 20*l.* a year to the Society.

MR. JOHN McLAREN said that he was sorry that they had met under such sad circumstances. Lord Derby asked the question: "Were they going forward?" As a Member of the Society of over thirty years' standing, he hoped that every Member would answer that question in the affirmative, and that the Royal Agricultural Society, which had done so much for Agriculture in the past, would continue its useful career, but under more favourable circumstances than ever. The best way to do that, in his opinion, was to look facts firmly in the face, to ascertain what was the present position of the Society, how it got to this pass, and what was the best way out of it. He had maintained all along that one of the great sources of loss to the Society was the enormous expenditure at headquarters at Hanover Square. They had an income from subscriptions of a little over 6,000*l.* a year, and they paid more than 6,000*l.* a year in salaries; they had a house which cost them 2,000*l.* a year, with rates and taxes, and these two items alone amounted to, roughly, 8,000*l.*, which had to be met out of an income of 6,000*l.* They had had the Shows "trotted out," but with the exception of the Maidstone Show—which was a serious blunder on the part of the Council—the Shows for forty years had not been a loss to the Society, as had been represented. He claimed that the first thing they ought to do was to set their house in order at Hanover Square, and go into rooms at about 600*l.* a year, which would be ample for the business of the Society.

Another grievous fault and source of loss of Members and money had been the unfortunate blunder of settling at Park Royal. Park Royal had been purchased by the Council without conferring with the Members, and in spite of the protests of the

Members. It was, in his opinion, simply a bog in which had been sunk 23,000*l.* or 24,000*l.* He hoped that the Members would see to it that that was put right. They were entitled to ask the Council, as far as possible, to retrace their steps after losing 18,000*l.* or 19,000*l.* in the two Shows already held there, but do not let them heave any more money into the bog. He maintained that before the Council sent out their circulars asking the Members what they would do to help the Society, they should have given the Members a lead by saying what they were prepared to do themselves. There was a moral obligation upon those gentlemen who led them into the trouble to show them the way out. So far, he had himself not seen his way to make any offer of subscription, because it appeared to him to be a great pity to throw good money away; and until the new arrangements were in force, he would not contribute anything towards the funds of the Society; but he would be glad to do so as soon as the Society was placed on a satisfactory basis, and as a Life Member to pay a yearly subscription, and he hoped that a great many others would do the same. The meagre response to the appeal was very suggestive. What did it mean that out of such a large Membership only 5,000*l.* was offered to help the Society in its difficulties? It was the expression of despair that Members, who had been hitherto ignored, would not open their purses or open their hearts. They were satisfied that no good could come out of Park Royal. Why did not the Council acknowledge their mistake? Why did not they promise to clear out of Park Royal? He did not say this year. If they wanted a Show next year, hold it at Park Royal. They were told that there was a surplus of 16,000*l.* available on Park Royal. As business men, why did they not secure that 16,000*l.* at once, and not leave it there to lose it gradually? The expenditure on salaries and house rent ought to be reduced. He was of the opinion that they ought to have a practical agriculturist as Secretary. If the Council would carry these suggestions into effect, he was sure the Members would rally round and provide the needful,

and the Society would be more prosperous in the future than it had ever been in the past.

The Marquis of WINCHESTER thought that the feeling of the general body of the subscribers to the Society was that, if the Council would frankly tell its Members what steps had been taken to reduce the enormous expenditure in connection with both salaries and the Society's house, they would go away from that room feeling that the Council were desirous of doing what they could to improve the position of the Society. Members would all feel that the loss of the Royal Agricultural Society of England would be a great blow to the country, and he believed that they would put their hands in their pockets to support it. It was no use saying that it was intended to hold another Show at Park Royal next year if it was thought the Society would sustain another loss. Lord Derby had referred to the local gentlemen who had to put their hands in their pockets when the Society's Show came into their district. Speaking for himself, he felt sure that these local gentlemen would gladly do so when the Show was held in their localities, but not when it took place in London. With regard to Park Royal, he had certainly understood that it was a freehold property; but it now seemed to him that the Council had not acquired the freehold, and that they had to pay a certain sum of money, and that the vendor had a pre-emptive right to purchase the site within a certain period of years. He thought that the Society might just as well get rid of Park Royal, and if this was done after next year he would also wish that there should be a distinct understanding that their Council would be elected by the Members, as was the case with ordinary agricultural societies. There was one other point in this connection which had been mentioned by Lord Derby, and that was the election of the Members of Council by proxy. Personally, he deprecated anything of the sort, for if the Members of the Society had its interests at heart he thought it would not be too much to expect them to come and vote personally. Proxies, moreover, were very often misused.

In the Supplemental Charter which the Council were now engaged in obtaining, he hoped that it would be distinctly understood that there would be no voting by proxy.

Mr. G. NORRIS MIDWOOD inquired if one item, which appeared in the statement of receipts and expenditure, could be explained to him, viz., the meaning of the word "Rent," in connection with the showground. As he understood the position, the Park Royal ground was purchased for 250*l.* per acre, and that a mortgage was raised on the property. Would it not be much better to say, "Interest on Mortgage"? He was of the opinion that the item was wrongly termed. He would further ask who was getting the benefit from Park Royal from the football matches that were being held there?

Lord DERBY said there was no doubt that when Park Royal was acquired it was meant to be the property, and was the property, of the Royal Agricultural Society of England. The question had arisen whether their Charter would allow them to deal with the ground at a time of the year when the Society did not want it. Acting under the advice of the Society's solicitors, a company was formed, to work *puri passu* with the Royal Agricultural Society, for the control of the ground, and to enable the Society, through that company, to deal with persons who might require it for football or for any other purposes when the Society had done with it. Strictly speaking, the ground would not otherwise be of any use but for grazing purposes, and it was thought that the Society could make money out of it. The Society held all the shares, the Directors were appointed by the Council, and the company was the creature of the Society. For the purposes of account it was found that the most regular way of presenting the accounts for audit would be to deal with Park Royal as a separate company. Therefore every farthing had been spent for the benefit and in the interests of the Society. The item of "Rent"—which included rates and taxes—was the value which could be charged for the use of the ground. It was all the Society's money, and it

went practically out of one pocket into the other. Of course, the profits on football and any other use of the ground at the "dead" time of the year would come in as payments to the Society.

Mr. R. A. LISTER said that, although he had been an exhibitor at the Shows of the Royal Agricultural Society for nearly thirty years, that was the first occasion on which he had taken an active part in their deliberations. He came there that day as one of those whom he thought conducted very largely to the success, such as it had been, of the Royal Agricultural Society—he meant the agricultural implement exhibitors. He thought that they ought not to go away without expressing themselves candidly. He was one of those who did not approach this question with the desire to criticise or unduly find fault, but rather to deal with the question of what was best to be done to place the Royal Agricultural Society once more on a working basis. It seemed to him that there were two aims that they ought to have in view at the present moment in order that they might not be reaching out in the far distance for something which did not immediately concern them. What could they do to ensure a Show being held in 1905, and with that object in view how far were they going to support it? While he had not answered the printed circulars sent round, it was not because he had nothing to contribute, but because he wanted to come up to the Smithfield Show and hear what his brother exhibitors had to say. He would be glad to subscribe 25*l.* towards next year's Show, and also to increase, if there was a general expression of opinion in that direction, the charges for space for next year. With regard to the reduction of the expenses of the establishment, he was not one of those who wanted the Council to go on their knees and humiliate themselves, and he was quite content to leave matters in their hands.

The alteration of the Charter was imperative, because if the Society was to be really representative of Agriculture it must be elected in a democratic spirit, and from the various

counties that went to make up the success of the Society. He had carefully considered the matter of Park Royal (and he had had a great deal of experience of Shows,) and he was not yet convinced that Park Royal was a mistake. At all events, after the large sums of money that had been spent on it, he thought it would be absurd to give it up without further trial. As an implement exhibitor, he had taken some trouble to find out the number and class of people who visited his firm's stand at the Park Royal Show. Of course that was a matter which concerned the interests of the implement exhibitors, but as the money-finders of the Society he thought it quite right to press this point. It was true that the implement exhibitors had to get the money out of the agriculturists in the long run—(laughter)—but still for immediate purposes they were the people who really found the money. It was an undoubted fact that the most profitable Show that the implement exhibitors had was the Smithfield Show, which was being held that week. Why was that? Because they could get the people together under one roof in what was practically the metropolis of Europe.

He had made careful inquiries and found that the class of people who visited his stand were mostly men who came with the intention of doing business, and he believed that if the Society could stick to Park Royal a little longer it would be visited by large numbers of buyers from all parts of the continent of Europe.

He did not think that the Society had ever fully made use of the great influence it possessed by having connected with it the aristocracy of the country, the farmers, and the great implement manufacturers. They all knew that advertising was a very expensive item, and was one of those things which took away the hard cash quicker than anything else. He ventured to think those responsible for the advertising of the Show should make use of every Member and every exhibitor by asking them how many circulars they would distribute in their own districts or counties. It would be a sufficient inducement to circulate these advertisements if the exhibitor

had his own name and stand number printed thereon. By this means they would permeate the whole of the United Kingdom. He hoped that those present would stand at the back of the Council, because he was quite sure that the Council, from a pecuniary point of view, would continue to do all in their power. They knew what had been done by Lord Derby, the Duke of Bedford, and others.

There was an element which had conduced to some extent to the failure of the Royal Agricultural Society which he did not think had received sufficient notice. The Royal Agricultural Society, with all its faults, had been the parent of the principal Agricultural Societies of the United Kingdom. It had been the pioneer, and had caused a large number of single-day shows to spring up in every part of the country, which had to a great extent killed their parent. He thought that all the local Agricultural Societies should have some *locus standi* in connection with the Royal Agricultural Society, and be asked to support that Society, and that children all over the country should support the parent.

Mr. E. R. BERRY TORR said that they had heard from Mr. Lister of the agricultural implement exhibitor's point of view. He had no doubt that the advertisement would be very useful, but if they went back to the Shows held in the neighbourhood of London, at Battersea and Kilburn, it would be very difficult to find any great financial success to the Society. That was the main feature that they had to decide that day—not whether it was better for a certain class of exhibitors, but whether it was the best for the finances of the Society. They all wished to see it placed on a sound financial basis. If this sum of money was forthcoming, and they held a Show at Park Royal which resulted in financial loss, what were they going to do then? They must be very careful, in embarking on a new Charter, to put the Society on a sound basis. Their object was to benefit agriculture all over Great Britain, but in having a fixed Show, they were now losing ground by reversing their policy.

Mr. E. O. GREENING said that if the meeting were to adopt the Report they would be in a position to deal with the question of the Society. He was not at all anxious to stifle discussion, but business men should confine themselves to business principles. He would suggest that they should adopt the Report, and then there would be an opportunity afterwards of discussing the matters upon which many of them might agree or disagree.

Mr. J. D. FLETCHER inquired whether, if that meeting adopted the Report, the question of holding a Show would be left to the present Council, or to a future Council? Would they have any Show until an approximate sum of 10,000*l.* was guaranteed?

The PRESIDENT replied that what they wanted to do was to hold the Show without further loss to the Society.

Lord DERBY said that the Show must be settled by the Council as at present constituted. A Council under a new system could only be appointed under the provisions of the draft Charter. The terms of this new Charter would have to be settled, and would have to meet with their approval, and then it would have to go forward to the Privy Council; and the Privy Council—like most other Government bodies—would take their own time to deal with the matter. He, therefore, thought that the new Charter would hardly be ready and be received back by the Society again before the month of May; and long before that time they must be dealing with the Show. This, he hoped, would explain the position.

Mr. A. MANSELL said he took it that the exhibitors of live stock, and also of implements, at the Society's Shows exhibited at reduced fees by belonging to the Society, and he thought that some proportion of their subscriptions should be credited to the Show accounts. For his own part, he was rather astonished to find that the Council were not apparently prepared to go forward with the Show next year. It seemed that they had over 5,000*l.* already subscribed, and with a loss of 7,000*l.* on the Show held last June, it would appear that they only

wanted about 1,700*l.* more to enable them to hold a Show next year. Lord Derby in his speech had alluded to the fact that the Members must "put their shoulders to the wheel," and he (Mr. Mansell) believed that they would desire to do so. He was sorry that this General Meeting of Members had been convened so late in the week. Many farmers and others connected with the Society would have been glad to attend the meeting if it had been held earlier, but they could not afford to wait until Thursday, after they had attended the Smithfield Show. The refreshment arrangements at the Society's Show were very unsatisfactory, and he noticed that the amounts the Society received from the contractors under their present arrangements were not so large as under their old system.

Mr. LAWRENCE C. TIPPER said he was one of those who had been anxious to see whether they were in a position to do something to preserve the continuity of the Shows of the Royal Agricultural Society. Since the Conference of the Council with the exhibitors in the Implement Department, he had personally interviewed several of the exhibitors, and he was sorry to say that the expression of opinion was averse to a Show at Park Royal next year. At the last Show the Society had lost over 6,000*l.*, and in the previous year they had also lost money, but they had not taken into consideration the losses sustained by exhibitors. There were some who had made money, and, of course, those exhibitors would be anxious to have a Show at Park Royal next year; but, on the other hand, he knew exhibitors who were at the first Park Royal Show, who had dropped out this year, and there were some who had exhibited this year who would drop out next year. The Society would have to face a diminished revenue from its implement exhibitors. The Society was asking for help to liquidate a debt. Were they going to get support from exhibitors simply to get rid of the present debt, and to come again next year and ask them again to pull the Society out of the mire? Could it be shown, conclusively, that the Show

would be a good thing? At the conference he had had it in his mind that a Show next year at Park Royal would be a success, but he was now of opinion that if the Society had another Show at Park Royal it would be a disaster.

Mr. C. R. W. ADEANE felt that not only the majority of agriculturists, but the whole of England were of one mind in the wish that the Royal Agricultural Society should be maintained in all its prosperity, and that the continuity of the Shows should not be broken. Their Shows of recent times had not, perhaps, that agricultural educational value as in the old days, but nevertheless it was the only great Show of its kind in the country, and it still had a great agricultural value, if it had not an educational value. He thought that all breeders of live stock would recognise that it was most important especially for the foreign trade, because, undoubtedly, it gave a great opportunity to foreigners to come over to this country to see the finest products of agriculture in its every branch which were there exhibited. It was true there were the magnificent Shows of the Bath and West and the Royal Counties, but foreigners could not come over at different periods of the year to attend these Shows, and they looked to the Show of the Royal Agricultural Society as the one great opportunity of the year to see the finest stock. He believed the great feeling amongst the Council was that, perhaps, the most important feature of the Society was their great National Show. He was of the opinion that what had been carried out by the Society in the past in connection with education was now done by the County Councils by means of technical education. He was strongly of the opinion that the question for them to consider was whether the Society should "clear out" of Park Royal or not. He understood that the Council were engaged in the preparation of a new Charter, which would have the effect of making the election to its body more representative, and he thought that was a great point. But the main object on which they should concentrate their attention was the holding

of their Show next year, so that there should be no break in its continuity. Further, he was of opinion that all the other questions contained in the Report presented to the Meeting should be postponed until the new Council was elected.

Mr. JAMES WATT said he should like to propose that the present Council be given instructions to prepare for the next Show at Park Royal, and in the meantime let them begin to re-construct the Council upon a popular basis. He came from the extreme north of England, where the feeling of the Members of the Society was very much against the step taken in going to Park Royal. He thought that if they were given an opportunity of taking a more direct interest in the Society, they would come to the help of their great National Society in increasing numbers as Members, and thus the usefulness of the Society would be continued in the future to even a greater degree. He did not think it desirable to cut down expenses to too fine a point, as he was of opinion that a cheese-paring policy was not a good one. He would suggest that the Members of the Society and all others interested in its welfare should put their shoulders to the wheel, and thus show that English agriculture was still flourishing.

Mr. WILLIAM GRAHAM thought that it would be more practical to come to a conclusion at once as to whether it would not be advisable to hold a Show in 1905. He thought that with the sum of 4,500*l.* already promised, by re-arrangement of the classes in the prize sheet, and by reduction in various ways of the expenses, they need not fear facing a Show at Park Royal next year. Afterwards the Members could be consulted as to the desirability of continuing the Shows at Park Royal in the future, or of going round the country as heretofore. They would recall the success of Shows in the past under the able guidance of Sir Jacob Wilson: he was of opinion that had Sir Jacob Wilson been consulted a little more with respect to the management of the Society's affairs they would not have found themselves in their present position.

He firmly believed that there were many who were of the opinion that they should hold a Show next year, and he thought that that meeting should take upon themselves the responsibility of deciding the point at once. His personal opinion was that perhaps it would be very much wiser not to hold a Show next year, but, on the other hand, the general opinion would seem to be in favour of holding a Show in 1905. No doubt a great many of them would be pleased to help to increase the sum of over 4,500*l.* already promised. If, therefore, all these gentlemen were agreed to hold a Show in 1905 let them join in guaranteeing a further sum.

Mr. WILLIAM COOPER said that although he had not been long a Member of this Society, he had been connected with agriculture all his life. There seemed to be a doubt in Lord Derby's mind, when he was speaking at the Council meeting on the previous day, as to the advisability of holding a Show next year. That had so impressed him that he had determined to come there that day to express the opinion that the absence of a single Show of the Royal Agricultural Society would be next door to fatal. How many Members were there whose only interest in the Society was the Show? How many agricultural implement makers would remain to the Society if there was a possibility of the Shows being done away with? He ventured to say, none. He had listened with the greatest possible attention and interest to the speeches that had been made, but he did not think they had touched the absolute blot of the Society, which was finance. They must reduce their establishment expenses in order to continue to hold the Shows in a successful manner. He regretted exceedingly that Lord Derby had not given them some assurance that the Council were perfectly alive to the question of finance, and that they were going to try to redeem the usefulness of the Society. Many of the establishment charges might be greatly reduced. He did not wish to move any amendment, but he did want to impress on the Council the absolute necessity, if they were to be a solvent affair, for bringing their expenditure

within their income. Why did they not have a better response from their enormous number of Members to the appeal? Most bodies of directors, when they found that their shareholders did not support them, came at once to the conclusion that they were on the wrong track, and that they did not sufficiently command the confidence of their shareholders. He was sorry to have to say that, but it was patent to every one, and the case of the Society was a desperate one. He urged them not to wait another year before they began to set their house in order.

The PRESIDENT then put the motion for the adoption of the Report, and declared it to be carried unanimously.

Vote of Thanks to Auditors.

On the motion of Mr. H. GRINLING, seconded by Mr. W. FITZHERBERT-BROCKHOLES, a cordial vote of thanks was passed to Mr. Jonas M. Webb, Mr. Hubert J. Greenwood, and Mr. N. P. Squarey for their services as Auditors during the past year, and these Members were unanimously re-elected as Auditors for the ensuing year.

Proposed Supplemental Charter.

The ordinary business of the meeting being thus concluded, the meeting was made Special, with a view to consideration of the terms of the Petition to the King in Council for a Supplemental Charter to the Society.

The PRESIDENT explained that the Council had had this draft Petition before them at a meeting held that morning, and had approved it for submission to the General Meeting of Governors and Members. He asked the meeting to allow the Society's Solicitor to read the Petition, and to explain its provisions.

Various Members raised the question as to whether the draft Petition and Charter could be properly considered by the meeting in view of its not having been previously circulated, and

Mr. B. ST. JOHN ACKERS suggested that a copy of the document should be circulated to all the Members, and that the Members should be called together again to have an opportunity of considering it and discussing it together.

Lord WINCHESTER moved that the present meeting be adjourned until a convenient date in January, and that during the interval a copy of the draft Charter should be circulated amongst the Members.

Colonel INCE seconded the motion.

The PRESIDENT, in accepting the suggestion, said that perhaps Wednesday, January 11, at 2 o'clock, would be a convenient time, as the next meeting of the Council was convened for that morning.

Mr. ELDRED WALKER suggested that the meeting should be held during the week of the Shire Horse Show, when an opportunity would be given for more Members to attend.

The PRESIDENT said he thought this date would be too late; and it was then formally decided to adjourn the meeting until 2 p.m. on January 11, 1905, for the further consideration of the terms of the Supplemental Charter.¹

Vote of Thanks to Chairman.

Mr. WILLIAM COOPER, in moving a hearty vote of thanks to the President for his services in the Chair that day, said that his Lordship had exercised the greatest possible patience, and he was sure that they were all deeply indebted to him.

Lord WINCHESTER, in seconding the motion, said he thought that the result of the postponement of the consideration of the Charter until January 11 would be to unloose the purse-strings of Members, who by contributing to the Fund, would enable the Council to hold a Show in 1905. He, for one, felt that what had been accomplished that day was a great step towards making the Royal Agricultural Society popular, and if it were felt necessary to hold a Show next year he would be happy to send a donation to the Society. He hoped that his example in this respect would be followed by all those who had discussed the question. He therefore asked the meeting to tender a vote of thanks to their noble President, and

¹ At this adjourned meeting on January 11, 1905, the Petition for a Supplemental Charter was approved, and the Petition was subsequently sealed with the seal of the Society, and deposited at the Privy Council Office.

to supplement that vote by sending in their subscriptions to the fund for the promotion of the Society's interests.

The Earl of FEVERSHAM said there was evidently a strong feeling in favour of having a Show next year, and he for one quite agreed with that feeling, but the holding of a Show depended upon whether gentlemen would come forward with further subscriptions. He hoped that Members would take that into consideration, and try, before the next meeting of the Council took place in January, to obtain sufficient funds to enable the Society to carry on the Show.

The vote of thanks having been carried by acclamation,

The PRESIDENT, in acknowledging the vote, said he hoped that when they next met they would be able to announce their intention to hold a Show next year at Park Royal, and that Members would in the meantime use their best endeavours to get the money together which was required for the purposes of the Show.

The formal proceedings of the meeting then terminated, but at the request of a large number of Members who remained, Mr. ARTHUR E. CLARKE, of Messrs. Garrard, James, and Wolfe, Solicitors to the Society, read the draft of the Petition and Supplemental Charter, and explained the effect of its provisions.

Notice is hereby given that the Sixty-Sixth Anniversary Meeting of Governors and Members of the Royal Agricultural Society of England will, in accordance with Clause 6 of the Charter of 1840, be held at the Society's House, 13 Hanover Square, London, W., on MONDAY, MAY 22, 1905, at Noon, when the Half-yearly Report of the Council will be read, and the election of the President, Trustees, and Vice-Presidents, and of Twenty-five Members of Council, will take place.

ERNEST CLARKE, *Secretary*.

13 Hanover Square, London, W.
February, 1905.

THE SOCIETY'S SHOW OF 1904,
HELD AT
PARK ROYAL, WILLESSEN, LONDON, N.W.
JUNE 21-25, 1904.

PRESIDENT :
THE EARL OF DERBY, K.G.

OFFICIALS :

Honorary Director.

PERCY CRUTCHLEY, Sunninghill Lodge, Ascot.

Stewards of Live Stock.

FREDERICK REYNARD, Sunderlandwick, Driffeld, Yorks.
F. S. W. CORNWALLIS, Linton Park, Maidstone.
E. W. STANYFORTH, Kirk Hammerton Hall, York.
VISCOUNT BARING, Stratton, Micheldever, Hants.
R. M. GREAVES, Wern, Portmadoc, North Wales.
HOWARD P. RYLAND, Moxhull Park, Erdington, near Birmingham.

Stewards of Implements.

R. NEVILLE GRENVILLE, Butleigh Court, Glastonbury.
W. A. PROUT, Sawbridgeworth, Herts.
CAPTAIN W. S. B. LEVETT, Milford Hall, Stafford.

Steward of Dairying.

R. C. ASSHETON, Hall Foot, Clitheroe, Lancs.

Steward of Forage.

GEORGE H. SANDAY, Highfield, Uxbridge.

Stewards of Finance.

E. VINCENT V. WHEELER, Newnham Court, Tenbury, Worcestershire.
W. FRANKISH, The Moorlands, Bracebridge, Lincoln.

Steward of Agricultural Education Exhibition.

J. BOWEN-JONES, Beckbury, Shrewsbury.

Steward of British Forestry Exhibition.

The MARQUIS OF GRANBY, Belvoir Castle, Grantham.

Secretary.

SIR ERNEST CLARKE, 13 Hanover Square, London, W.

Assistant Director.

Supt. of the Showyard.

J. E. COMPTON-BRACEBRIDGE.

ROBERT S. BURGESS.

JUDGES OF MISCELLANEOUS IMPLEMENTS.

Miscellaneous Implements entered for Silver Medals.

J. BROUGHTON DUGDALE, Wroxall Abbey, Warwick.
FRANCIS E. WALKER, Estate Office, Alnwick Castle.

JUDGES OF STOCK, &c.

(As finally corrected.)

HORSES.

Shires.—*Classes 1-7.*

JOHN NIX, Stud Farm, Alfreton.

Clydesdales.—*Classes 8-13.*

JAMES F. MURDOCH, East Hallside,
Newton, Glasgow.

Suffolks.—*Classes 14-21.*

HORACE WOLTON, 57 Henley Road,
Ipswich.

Draught Horses.—*Classes 22 & 23.*

C. W. TINDALL, Wainfleet, S.O., Lincs.

Hunters.—*Classes 24, 25, 28 & 29.*

LORD SOUTHAMPTON, 15 Hyde Park
Street, London, W.

Hunters.—*Classes 26, 27, 30 & 31.*

T. L. WICKHAM-BOYNTON, Burton
Agnes Hall, Driffield.

Cleveland Bays and Coach Horses.—
Classes 32-34.

THOMAS LEEFE, Fryton, Slingsby,
York.

Hackneys.—*Classes 35-40.*

JOSEPH MORTON, Stow, Downham
Market.

Ponies.—*Classes 41-43.*

JOHN HILL, Marsh Brook House,
Church Stretton.

Shetland Ponies.—*Classes 44-47.*

JAMES DUNCAN, Fern Villa, Inverness.

Polo and Riding Ponies.—*Classes 48-54.*

Sir H. F. DE TRAFFORD, Bt., Hill
Crest, Market Harborough.

Harness Horses and Ponies.—
Classes 55-61.

ROMER WILLIAMS, Park Lodge, Park
Place, Albert Gate, S.W.

C. B. E. WRIGHT, Bolton Hall,
Clitheroe.

Four-in-Hand Teams.—*Class 62.*

Lt.-Col. F. SHUTTLEWORTH, 17
Berkeley Square, W.

Trotting Horses.—*Class 63.*

ARCHIBALD SINCLAIR, Twickenham.

CATTLE.

Shorthorn Bulls.—*Classes 64-66.*

WILLIAM WRIGHT, Scamblesby
House, Horncastle.

Shorthorn Cows and Heifers.—
Classes 67-72.

F. PUNCHARD, Underley Estate Office,
Kirkby Lonsdale.

Lincolnshire Red Short-horns.—
Classes 73-78.

THOMAS B. FRESHNEY, South Somer-
cotes, Louth.

Herefords.—*Classes 79-84.*

J. W. SMITH, Thing-hill Court, Here-
ford.

Devons.—*Classes 85-90.*

ROBERT COOK, Chevithorne Barton,
Tiverton.

South Devons (Hams).—*Classes 91 & 92.*

JOHN WOOD, Bourton, Totnes.

Sussex.—*Classes 93-98.*

W. MASSIE, Estate Office, Shillinglee
Park, Petworth.

Welsh.—*Classes 99-102.*

WILLIAM JONES, Llymgwyn,
Chwilog, R.S.O.

Red Polled.—*Classes 103-108.*

HERBERT BLOFIELD, Morley Manor,
Wymondham.

Aberdeen Angus.—*Classes 109-112.*

W. S. FERGUSON, Pictstonhill, Perth.

Galloway.—*Classes 113-116.*

WILLIAM STROYAN, Culcaigrie,
Twynholm, N.B.

Highland.—*Classes 117 & 118.*

D. A. STEWART, Lochdhu, Nairn, N.B.

Ayrshire.—*Classes 119 & 120.*

MATTHEW TEMPLETON, Sandyknowe,
Kelso, N.B.

Jersey Bulls.—*Classes 121-123.*

The Hon. ALEX. E. PARKER, Pickhill
Hall, Wrexham.

Jersey Cows and Heifers.—
Classes 124-127.

G. P. MEAD, The Woodlands, Bicton,
Shrewsbury.

Guernseys.—*Classes 128-133.*

H. J. GIBBS, Milford, Salisbury.

Longhorns.—*Classes 134-137.*

JOHN T. OXLEY, Stowe, Buckingham.

Kerry and Dexter.—*Classes 138-143.*

GEORGE FRED. ROUMIEU, Willey
Park, Farnham.

Dairy Cows.—*Classes 144 & 145.*

CHARLES MARSHALL, Broomhaugh,
Riding Mill-on-Tyne.

Butter Tests.—*Classes 146 & 147.*

ERNEST MATHEWS, Little Shardeloes,
Amersham, Bucks.

SHEEP.

Oxford Downs.—*Classes 148-151.*

H. OVERMAN, Kipton House, Weasen-
ham St. Peter's.

Shropshires.—*Classes 152-156.*

CHARLES COXON, Elford Park, Tam-
worth.

Southdowns.—*Classes 157-161.*

HERBERT J. GARROD, Cheveley,
Newmarket.

Hampshire Downs.—*Classes 162-166.*

HENRY LAMBERT, Babraham, Cam-
bridge.

Suffolks.—*Classes 167-172.*

J. C. DAWSON, Nacton, Ipswich.

Lincolns.—*Classes 173-179.*

R. C. BEMROSE, Frieston Green, Cay-
thorpe, Grantham.

Leicesters.—*Classes 180-183.*

H. H. STAVELEY, The Manor House,
North Dalton, Driffield.

Kent or Romney Marsh.—
Classes 192-196.

J. S. S. GODWIN, Hazlewood, Hadlow,
Tonbridge.

Wensleydales.—*Classes 197-200.*

B. J. HODGSON, Hallwith, Spenni-
thorne, Leyburn.

Dorset Horn.—*Classes 201-204.*

CHARLES HAWKINS, Waddon, Dor-
chester.

Devon Long Wool.—*Classes 205 & 206.*

JOHN CARPENTER, Pengelly's,
Alphington, Exeter.

Dartmoor.—*Classes 207 & 208.*

JOHN WOOD, Bourton, Totnes.

Exmoor.—*Classes 209 & 210.*

R. MOGRIDGE, Butterleigh, Cullomp-
ton.

Cheviots.—*Classes 211 & 212.*

G. G. REA, Middleton, Wooler.

Black-faced Mountain.—
Classes 213 & 214.

J. MOFFAT, Gateside, Sanquhar,
R.S.O., N.B.

Lonks.—*Classes 215 & 216.*

EDWARD MASON, Watercreek, Nat-
land, Kendal.

Herdwicks.—*Classes 217 & 218.*

JOHN HAWELL, Armboth House,
Thirlmere, Grasmere.

Welsh Mountain.—*Classes 219 & 220.*

THOMAS ROBERTS, Aber, near Bangor.

Ryeland.—*Classes 221-223.*

HENRY W. TAYLOR, Showle Court,
Ledbury.

PIGS.

Large Whites.—*Classes 224-227.*

JOHN BARRON, Elvaston House,
Borrowash, Derby.

Middle Whites.—*Classes 228-231.*

JOHN ANGUS, Whitefield, Morpeth.

Berkshires.—*Classes 232-235.*

T. A. EDNEY HAYTER, The Mount,
Whitchurch, Hants.

Tamworths.—*Classes 236-239.*

JOHN WATTS, Fair Green, Sarsden,
Chipping Norton.

Large Blacks.—*Classes 240-243.*

GEORGE PEDLEY, The Lowe Farm,
Buglawton, Congleton.

POULTRY.

Classes 244-360.

H. ABBOT, Thuxton, Norfolk.
D. BRAGG, Aikton, Wigton.
THOMAS LAMBERT, Bourne Mill,
Hadlow.
GEORGE H. PROCTER, Flass House,
Durham.

EGGS.

Classes 351 & 352.

ARTHUR NEWPORT, Holly Villa,
Acton Green, W.

PRODUCE.

Butter.—Classes 361-364.

THOMAS LATHAM, Bishops Court,
Dorchester, Oxon.

Cheese.—Classes 365-380.

F. CARPENTER, 87 Brompton Road,
London, S.W.

Cider and Perry.—Classes 381-384.

T. B. RICHARDS, Huxham, East
Pennard, Shepton Mallet.

Corn.—Classes 385-391.

RICHARD HEWLINS, St. Ives.

Wool.—Classes 392-399.

JOHN E. FAWCETT, Broadford Build-
ings, Canal Road, Bradford.

Hops.—Classes 400-405.

JOHN S. LOVETT, 52 Borough High
Street, London, S.E.

Hives and Honey.—Classes 406-442.

T. W. COWAN, The Nest, Westby Road,
Boscombe.

Rev. T. J. EVANS, Tarvin Vicarage,
Chester.

Dr. PERCY SHARP, Brant, Broughton,
Newark-on-Trent.

T. I. WESTON, Hook, Winchfield.

COMPETITIONS.

Horse-jumping.

The Hon. E. A. FITZ ROY, M.P., Fox
Hill, West Haddon, Rugby.
ROLAND BURKE, Normanby Estate
Office, Burton Stather, Doncaster.
R. B. LODER, Maidwell Hall, North-
ampton.
Captain HAROLD WALKER, 1st Life
Guards, Regent's Park, N.W.
C. B. E. WRIGHT, Bolton Hall,
Clitheroe.

Bending.

Major F. EGERTON GREEN, Hurling-
ham Club, London, S.W.
The Rev. D. B. MONTEFIORE, Mursley
Hall, Winslow.

Horse-shoeing.

HENRY G. LEPPER, M.R.C.V.S.,
Aylesbury.
JOHN MALCOLM, F.R.C.V.S., Holliday
Street Wharf, Birmingham.

Butter-making.

P. HEDWORTH FOULKES, Harper-
Adams Agricultural College, New-
port, Salop.

VETERINARY INSPECTORS.

HENRY G. LEPPER, M.R.C.V.S.,
Aylesbury.
Professor JAMES MACQUEEN,
F.R.C.V.S., Royal Veterinary Col-
lege, Camden Town, N.W.
JOHN MALCOLM, F.R.C.V.S., Holliday
Street Wharf, Birmingham.
HARRY MOORE, M.R.C.V.S., Potter
Street, Worksop.
JOHN M. PARKER, M.R.C.V.S., 9½
Moor Street, Birmingham.
Professor PENBERTHY, F.R.C.V.S.,
Royal Veterinary College, Camden
Town, N.W.

AWARDS OF PRIZES AT PARK ROYAL, JUNE, 1904.

ABBREVIATIONS.

I., First Prize. II., Second Prize. III., Third Prize. IV., Fourth Prize.
R. N., Reserve Number. H. C., Highly Commended. Com., Commended.

N.B. The responsibility for the accuracy of the description or pedigree, and for the eligibility to compete of the animals entered in the following classes, rests solely with the Exhibitors.

Unless otherwise stated, each Prize Animal in the Classes for Horses, Cattle, Sheep, and Pigs was "bred by Exhibitor."

HORSES.

Shires.

No. in
Cata-
logue.

Class 1.—Shire Stallions, foaled in 1901. [9 entries, 2 absent.]

- 5 I. (£15, & Champion.¹)—PHILO L. MILLS, Ruddington Hall, Nottingham, for **Intake Albert** 20596, bay, bred by Henry Murton, Southminster, Essex; s. Lockinge Albert 15695, d. Bonny 27707 by Engineer 2nd 9300.
- 7 II. (£10.)—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby, for **Hendrick** 20564, brown, bred by Lord Liangattock, The Hendre, Monmouth; s. Dunsmore Jameson 17972, d. Dunsmore Jessamine 28416 by East Anglian 14017.
- 8 III. (£5.)—ARTHUR RANSOM, Hitchin, Herts, for **Hitchin Royal Duke**, bay, bred by J. C. Richardson, Wendy, Royston; s. Duke of Worsley 13002, d. Wendy Pride 27215 by Pride of Blagdon 6272.
- 3 R. N. & H. C.—JAMES FORSHAW & SONS, Carlton-on-Trent, Newark, for **Force**.

Class 2.—Shire Stallions, foaled in 1902. [17 entries, 4 absent.]

- 24 I. (£15, & R. N. for Champion.¹)—R. N. SUTTON-NELTHORPE, Scawby Hall, Lines, for **Souldern Scylax** 21865, bay, bred by R. J. Rigby, Manor Farm, Souldern, Banbury; s. Scylax of Willington 18347, d. Souldern Lady 33972 by Willington Sir Edwin.
- 18 II. (£10.)—MAXIMILIAN MICHAELIS, Tandridge Court, Oxted, Surrey, for **Starborough Coronation** 21899, brown, bred by J. H. Bryars, Intake Stud Farm, Sheffield; s. Lockinge Albert 15695, d. Lockinge Breeze 29258 by Cœur-de-Lion 4th 11233.
- 10 III. (£5.)—H. M. THE KING, Sandringham, for **Ravenspur**, black, bred by Sir H. F. de Trafford, Bt., Hill Crest, Market Harborough; s. Blythwood King Maker 18534, d. Laurel 22046 by Maxie 13306.
- 11 R. N. & H. C.—CHARLES BELL, Norley Hall, Norley, Cheshire, for **Norley Advance**.

Class 3.—Shire Stallions, foaled in 1903. [11 entries, 6 absent.]

- 29 I. (£15.)—VICTOR C. W. CAVENDISH, M.P., Holker Hall, Lancs., for **Holker Menestrel** 2nd, bay; s. Birdsall Menestrel 19337, d. Royal Rose 26795 by Regent 2nd 6316.
- 31 II. (£10.)—WALPOLE GREENWELL, Marden Park, Woldingham, Surrey, for **Marden Lad**, bay; s. Hertfordshire Lad 18840, d. Saxon Royal 13365 by R. R. 6300.
- 32 III. (£5.)—LORD MIDDLETON, Birdsall House, York, for **Birdsall Calcium**, bay; s. Calamite 15037, d. Sperndrift 26922 by Grafton 2nd 13120.
- 34 R. N. & H. C.—E. E. PEARSON, Brickendonbury, Hertford, for **Ratcliffe Royal Ben**.

Class 4.—Shire Mares, with Foals at foot. [10 entries, 4 absent.]

- 45 I. (£10. & Champion.²)—LORD ROTHSCHILD, Tring Park, Herts, for **Blythwood Guelder Rose** 22998, brown, foaled 1895 [foal by Birdsall Menestrel 19337], bred by Sir James Blyth, Bt., Blythwood, Stansted, Essex; s. Prince Harold 14228, d. Tudor Rose 15842 by Hitchin Conqueror 4458.

¹ Champion Gold Medal given by the Shire Horse Society for the best Shire Stallion in Classes 1-3.

² Champion Gold Medal given by the Shire Horse Society for the best Shire Mare or Filly in Classes 4-7.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 40 II. (£6.)—WALPOLE GREENWELL, Marden Park, Woldingham, Surrey, for **Stanney Commotion** 24812, bay, foaled 1896 [foal by Tomboy 7th 20115], bred by the late William Parker, Great Stanney Hall, Sutton, Chester; s. Seldom Seen 15348, d. Stanney Pride 22502 by Vulcan 4145.
- 38 III. (£4.)—MISS ALICE DE ROTHSCHILD, Waddesdon Manor, Aylesbury, for **Lilac** 36407, bay, foaled 1900 [foal by Desford Colin 20241]; s. Markeaton Royal Harold 15225, d. Lily 22052 by Royal William 2nd 12207.
- 46 R. N. & H. C.—LEOPOLD SALOMONS, Norbury Park, Dorking, for **Childwick Youno**.

Class 5.—Shire Fillies, foaled in 1901. [8 entries, 5 absent.]

- 51 I. (£10, & R. N. for Champion.¹)—PHILO L. MILLS, Ruddington Hall, Nottingham, for **Ruddington Heirress** 40074, brown; s. Calwich Heirloom 14547, d. Hargate Bounce 28829 by Bury Victor Chief 11105.
- 50 II. (£6.)—H. W. KEARNS, Baxenden House, Accrington, for **Knottingley Fuchsia** 39383, bay, bred by William Jackson, Knottingley, Yorks; s. Knottingley Regent 18130, d. Knottingley Queen 29121 by Grandson 11508.
- 49 III. (£4.)—EARL EGERTON OF TATTON, Tatton Park, Cheshire, for **May Flower** 39625, bay, bred by John Wright, Backlane Farm, Ashley, Altrincham; s. Ercall Wynn 14620, d. Butterfly 19563 by Royal William 12207.

Class 6.—Shire Fillies, foaled in 1902. [10 entries, 4 absent.]

- 57 I. (£10.)—JOHN BRADLEY, Halstead, Tilton, Leicester, for **Halstead Duchess** 3rd 42121, brown; s. Menestrel 14180, d. Halstead Lady Harold 28812 by Markeaton Royal Harold 15225.
- 59 II. (£6.)—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby, for **Bonney Blue** 41101, brown, bred by W. Heckford, Streetfields, Lutterworth; s. Dunsmore Jameson 17972, d. Smart 43292 by Dunsmore Masterman 12874.
- 65 III. (£4.)—KENNETH H. WRIGHT, Yelvertoft Manor, Rugby, for **Toft Folly** 43583, bay; s. Dunsmore Jameson 17972, d. Southernwood Fiction 20871 by Blagdon Baron.
- 56 R. N. & H. C.—H.M. THE KING, Sandringham, for **Prospect**.

Class 7.—Shire Fillies, foaled in 1903.² [22 entries, 10 absent.]

- 71 I. (£10.)—WALPOLE GREENWELL, Marden Park, Woldingham, Surrey, for **Marden Queen**, bay; s. Dunsmore Jameson 17972, d. Westwood Queen 22694 by Nailstone Rising Star 14754.
- 77 II. (£6.)—LORD MIDDLETON, Birdsall House, York, for **Birdsall Silvern**, bay; s. Calamite 15037, d. Silver Fir 20832 by Kingcraft 2nd 11707.
- 66 III. (£4.)—H.M. THE KING, Sandringham, for **Dunsmore Nightingale**, brown, bred by George Linnell, Sulby, Rugby; s. Dunsmore Jameson 17972, d. Naseby Blackbird 36717 by Catthorpe Irving 14555.
- 76 R. N. & H. C.—MAXIMILIAN MICHAELIS, Tandridge Court, Oxted, for **Pailton Sorais**.

Clydesdales.

Class 8.—Clydesdale Stallions, foaled in 1901. [3 entries.]

- 89 I. (£10, & R. N. for Champion.³)—A. & W. MONTGOMERY, Netherhall and Banks, Kirkcudbright, for **Baron Alister** 11595, bay, bred by James McAlister, Meikle Kilmory, Rothesay; s. Baron's Pride 9122, d. Jessie of Meikle Kilmory 13147 by Prince Gallant 6176.
- 88 II. (£6.)—RICHARD DUNN, Udston, Hamilton, for **Prince of London** 11859, brown; s. Baron's Pride 9122, d. Countess 15014 by Royal Gartly 9844.
- 90 III. (£4.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Lockhart** 12212, brown, bred by Mr. Wither, near Stranraer, N.B.; s. Airies Prince 10667, d. Adrienne 13499 by Mains of Airies 10379.

Class 9.—Clydesdale Stallions, foaled in 1902. [5 entries, 2 absent.]

- 94 I. (£10, & Champion.³)—A. & W. MONTGOMERY, Netherball and Banks, Kirkcudbright, for **Refiner** 12301, bay, bred by George Pendreigh, Dalhousie, Bonnyrigg; s. Baron's Pride 9122, d. Lady Evergreen 15223 by Macgregor 1487.
- 93 II. (£6.)—A. & W. MONTGOMERY, for **Fairy King** 12138, brown; s. Baron's Pride 9122, d. Fortune 15191 by Macgregor 1487.
- 95 III. (£4.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Chamberlain**, brown; s. Airies Prince 10667, d. Johanna 13903 by Gallant Prince 10552.

¹ Champion Gold Medal given by the Shire Horse Society for the best Shire Mare or Filly in Classes 4-7.

² Prizes given by the Shire Horse Society.

³ Champion Prize of £10 given by the Clydesdale Horse Society for the best Clydesdale Stallion in Classes 8-10.

c *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 10.—Clydesdale Stallions, foaled in 1903. [5 entries, 1 absent.]

- 97 I. (£10.)—THE DUKE OF LEEDS, Hornby Castle, Bedale, for **Treasurer Godolphin**, dark brown; s. Drumflower 10537, d. Banks Treasurer 14273 by Baron's Pride 9122.
 99 II. (£6.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Pearlriver**, black; s. Atries Prince 10667, d. Pink Pearl by Johnnie's Style 6857.
 98 III. (£4.)—A. & W. MONTGOMERY, Netherhall and Banks, Kirkcudbright, for bay, bred by W. Hood, Chapellton, Borgue, N.B.; s. Baron's Pride 9122, d. Elsa of Chapellton 14623 by Flashwood's Best 9211.
 100 R. N. & H. C.—THOMAS SMITH, Blaen Point, Chester, for brown.

Class 11.—Clydesdale Mares, with Foals at foot. [3 entries, absent.]

Class 12.—Clydesdale Fillies, foaled in 1901. [4 entries, 1 absent.]

- 107 I. (£10. & **Champion**.¹)—FENWICK WILSON, Marden, Cullercoats, Northumberland, for brown, bred by R. & J. Shennan, Balig, Kirkcudbright; s. Woodend Gartley 10663, d. Sheila 11981 by Sir Everard 5353.
 106 II. (£6. & **R. N. for Champion**.¹)—THOMAS SMITH, Blaen Point, Chester, for **Baroness Burgany**, bay, bred by W. Kerr, Houdston, Girvan, N.B.; s. Baron's Pride 9122, d. Nancy Snodgrass 14639 by Prince Alexander 8899.
 105 III. (£4.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Princess Marcella**, bay, bred by M. Marshall, Bridgebank, Stranraer; s. Marcellous 11110, d. Swallow 13952 by Prince of Wales 673.

Class 13.—Clydesdale Fillies, foaled in 1902. [3 entries.]

- 109 I. (£10.)—THOMAS SMITH, Blaen Point, Chester, for **Jewel**, bay, bred by A. & W. Montgomery, Netherhall and Banks, Kirkcudbright; s. Baron's Pride 9122, d. Graceful 13977 by Macgregor 1487.
 108 II. (£6.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seabam Harbour, for **Baroness**, bay, bred by Lord Arthur Cecil, Orcebadmains, Tonbridge; s. Baron Briton 10678, d. Cynthia 11252 by Claymore 3522.
 110 III. (£4.)—WILLIAM THOMPSON, Round Hill, Crakehall, Bedale, for bay; s. Lord Stewart 10084, d. Peerless 11445 by Old Times 579.

Suffolks.

Class 14.—Suffolk Stallions, foaled in or before 1900.² [5 entries, 1 absent.]

- 113 I. (£10.)—A. J. SMITH, Rendlesham, Woodbridge, for **Saturn** 2653, foaled 1896; s. Wedgewood 1749, d. Stella 2427 by Cupbearer 3rd 566.
 114 II. (£5.)—THE REV. HENRY TAYLOR, The Hall, Lavenham, for **Court Fop** 2803, foaled 1899, bred by W. Byford, Bridge Farm, Long Melford; s. Court Dandy 2741, d. Bonny Lass 3187 by Playford 1677.
 115 R. N. & H. C.—R. EATON WHITE, Boulge Hall, Woodbridge, for **Boulge Conqueror**.

Class 15.—Suffolk Stallions, foaled in 1901. [4 entries.]

- 117 I. (£10.)—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Saint** 2989; s. Prince Albert 2525, d. Eyke Scandal 3806 by Queen's Diadem 1721.
 119 II. (£6.)—R. EATON WHITE, Boulge Hall, Woodbridge, for **Boulge Monarch** 3054, bred by the late R. Holmes White, Boulge Hall; s. Prince Wedgewood 2364, d. Madge 4276 by Windsor Chieftain 2025.
 116 III. (£4.)—EDWARD QUILTER, Bentley, Ipswich, for **Bentley Cardinal** 2982, bred by George Rope, Blaxhall, Tunstall; s. Wedgewood 1749, d. Dido 3350 by Verger 1550.
 118 R. N. & H. C.—THE HON. W. F. D. SMITH, M.P., Great Thurlow, Suffolk, for **Neptune**.

Class 16.—Suffolk Stallions, foaled in 1902. [14 entries, 2 absent.]

- 128 I. (£10.)—A. GERALD SMITH, Great Bealings Hall, Woodbridge, for **Pilate** 3061; s. Wedgewood 1749, d. Plenty 2502 by Dandy 1617.
 129 II. (£6.)—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Sorcerer** 3077; s. Prince Albert 2525, d. Eyke Scandal 3806 by Queen's Diadem 1721.
 133 III. (£4.)—R. EATON WHITE, Boulge Hall, Woodbridge, for **Boulge Pluto** 3053; s. Saturn 2653, d. Brandy 4169 by Eclipse 2627.
 120 R. N. & H. C.—C. H. BERNERS, Woolverstone Park, Ipswich, for **Woolverstone Chief**.

Class 17.—Suffolk Stallions, foaled in 1903. [4 entries, 1 absent.]

- 135 I. (£10.)—A. GERALD SMITH, Great Bealings Hall, Woodbridge, for **Protest** 3125; s. Wedgewood 1749, d. Plenty 2502 by Dandy 1617.

¹ Champion Prize of £10 given by the Clydesdale Horse Society for the best Clydesdale Mare or Filly in Classes 11-13.

² Prizes given by the Suffolk Horse Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 137 **II. (£6).**—THE REV. HENRY TAYLOR, The Hall, Lavenham, for **William the First** 3137; s. Court Pop 2803, d. Stately 2nd 4335 by Prince F. 2307.
 136 **III. (£4).**—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Braggadocio** 3136; s. Saturn 2653, d. Bragg's 3821 by Queen's Diadem 1721.

Class 18.—Suffolk Mares, with Foals at foot. [4 entries.]

- 139 **I. (£10).**—SIR CUTHBERT QUILTER, BT., M.P., Bawdsey Manor, Woodbridge, for **Bawdsey China Doll** 4299, foaled 1898 [foal by Napolian 2933]; s. Prince Wedgewood 2364, d. Bawdsey Dolly 3611 by Czar 1754.
 141 **II. (£6).**—R. EATON WHITE, Boulge Hall, Woodbridge, for **Boulge Hebe** 4818, foaled 1900 [foal by Saturn 2653], bred by the late R. Holmes White, Boulge Hall; s. Golden Grain 2479, d. Nectar 4177 by Emperor 1611.
 140 **III. (£4).**—A. J. SMITH, Rendlesham, Woodbridge, for **Orange Girl** 4559, foaled 1899 [foal by Rendlesham Rufus 3039], bred by W. Gray, Parham Hall, Wickham Market; s. Prince Wedgewood 2364, d. Scott by Chief of the East 1503.
 138 **R. N. & H. C.**—ROBERT EDGAR, Knight's Hill, Cockfield, Bury St. Edmunds, for **Newbourne Kate**.

Class 19.—Suffolk Fillies, foaled in 1901. [5 entries, none absent.]

- 144 **I. (£10).**—SIR CUTHBERT QUILTER, BT., M.P., Bawdsey Manor, Woodbridge, for **Ramsholt Princess** 4949; s. Prince Wedgewood 2364, d. Ramsholt Beauty 3590 by Queen's Diadem 1721.
 143 **II. (£6).**—SIR CUTHBERT QUILTER, BT., M.P., for **Bawdsey Ruth** 4948, bred by Pratt & Sons, Melton, Woodbridge; s. Golden Grain 2479, d. Gypsy Queen 3120 by Dandy Dick 1830.
 145 **III. (£4).**—EDWARD QUILTER, Bentley, Ipswich, for **Bentley Diana** 4884, bred by E. M. Packard, Saxtead, Framlingham; s. Border Minstrel 2287, d. Polly 3739 by Pride's Pilgrim 1707.
 142 **R. N. & H. C.**—ROBERT EDGAR, Knight's Hill, Cockfield, for **Princess F.**

Class 20.—Suffolk Fillies, foaled in 1902. [3 entries, 1 absent.]

- 148 **I. (£10).**—A. GERALD SMITH, Great Bealings Hall, Woodbridge, for **Wisdom** 5107; s. Prince Albert 2523, d. Where's Hoo 3943 by Queen's Diadem 1721.
 149 **II. (£6).**—JOHN SYMONDS, Thistleton Hall, Burgh, Woodbridge, for **Diamond** 5104; s. Golden Grain 2479, d. Duchess 4033 by Warrior 1938.

Class 21.—Suffolk Geldings, foaled in or before 1899.¹ [5 entries, none absent.]

- 152 **I. (£10).**—SIR CUTHBERT QUILTER, BT., M.P., Bawdsey Manor, Woodbridge, for **Nelson**, foaled 1896.
 151 **II. (£5).**—SIR CUTHBERT QUILTER, BT., M.P., for **Bowler**, foaled 1899, bred by W. Toller, Gedgrave, Orford.
 153 **R. N. & H. C.**—EDWARD QUILTER, Bentley, Ipswich, for **Duke**.

Draught Horses

(Exhibited on Thursday, June 24, 1904).

Class 22.—Draught Mares or Geldings, not in harness.

- 7 **I. (£10).**—A. C. SPARKES, Oldfield Farm, Altrincham, for **Oldfield Duke**, brown Shire gelding, foaled 1900.
 1 **II. (£6).**—T. SIMPSON JAY, Warren Farm, Wimbledon, for **Dora** 28367, grey Shire mare.
 8 **III. (£4).**—A. C. SPARKES, for **Oldfield Prince**, brown Shire gelding, foaled 1899.
 2 **R. N. & H. C.**—T. SIMPSON JAY, for **Wimbledon Champion**.

Class 23.—Draught Mares or Geldings, regularly worked within a radius of 8 miles from Charing Cross for not less than 3 months previous to the date of entry, shown in harness without vehicles.

- 15 **I. (£10).**—W. H. JAY, Royal Wharf, Fulham, for **Duke**, skewbald gelding.
 14 **II. (£6).**—W. H. JAY, Gothic Wharf, Putney, for **Boxer**, grey gelding.
 12 **III. (£4).**—T. SIMPSON JAY, Warren Farm, Wimbledon, for **Diamond**, Shire mare.
 9 **R. N. & H. C.**—J. H. BEATTIE, 16 Pancras Road, N.W., for **Jack**.

¹ Prizes given by the Suffolk Horse Society.

eii *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Hunters.

Class 24.—*Hunter Mares, with Foals at foot, 13 stone and upwards.*

[8 entries, 3 absent.]

- 157 I. (£10, & Champion.¹)—LORD MIDDLETON, Birdsall House, York, for *Ladylike*, bay or brown, foaled 1891 [foal by Red Eagle]; s. Gordon, d. Laverock by King Harold.
- 158 II. (£6, & R. N. for Champion.¹)—LORD MIDDLETON, for *Sympathy* 2531, chestnut, foaled 1899 [foal by Red Eagle]; s. Gordon, d. Miss Sykes by Morocco.
- 160 III. (£4.)—W. P. TAYLOR, Hollington House, Newbury, for *Pauline*, bay, foaled 1893 [foal by Privado].

Class 25.—*Hunter Fillies, foaled in 1901.* [8 entries, 2 absent.]

- 170 I. (£10, & Champion.²)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *The Lady*, bay; s. Havoc, d. Lady Grosvenor by Westminster.
- 163 II. (£6.)—JOSEPH DALZELL, Moresby House, Whitehaven, for *Clara Topper*, chestnut, bred by J. Paisley, Waresley, Sandy; s. Marioni, d. Marjorie.
- 167 III. (£4.)—LORD MIDDLETON, Birdsall House, York, for *Scruple*, brown; s. Red Eagle, d. Scornful by Gordon.
- 165 R. N. & H. C.—EDWARD HODGSON, The Hollows, Bridlington, for *Marchioness*.

Class 26.—*Hunter Fillies, foaled in 1902.* [6 entries, none absent.]

- 171 I. (£10, & R. N. for Champion.²)—W. P. DARE, The Firs, Epsom, for *National Lassie* 2766, bay; s. Pumpernickel, d. St. Cloud 2794 by St. Symphorien.
- 175 II. (£6.)—J. L. NICKISSON, Hinton Manor, Swindon, for *Limelight*, chestnut, bred by J. W. Shute, Motcombe, Shaftesbury; s. Pantomime, d. Ruhy by Marioni.
- 176 III. (£4.)—EDWARD POWELL, Oakhank, Hoole, Chester, for *Paris Model* 2772, bay, bred by O. N. Holt-Needham, Castle Cary, Somerset; s. Pantomime, d. Goodcraft, by King Crafty.
- 172 R. N. & H. C.—ALFRED HOPCRAFT, Brackley, for *Light Heart*.

Class 27.—*Hunter Fillies, foaled in 1903.* [8 entries, 3 absent.]

- 180 I. (£10.)—J. L. NICKISSON, Hinton Manor, Swindon, for *Sister Anne*, chestnut, bred by C. W. Francis, Horsington, Templecombe; s. Pantomime, d. Clonsilla.
- 183 II. (£6.)—E. W. ROBINSON, Brookleigh, Esher, for *Isominster*, bay, bred by Sir W. Ingram, Bt., Westgate-on-Sea; s. Leominster, d. Isobarna 2718 by Ischar.
- 177 III. (£4.)—C. KELWAY-BAMBER, Priestlands, Horley, for *Columbine*, chestnut; s. Pantomime, d. Sweetheart 1641 by Napsbury.
- 184 R. N. & H. C.—COL. M. A. SWINFEN-BROUN, Swinfen Hall, Lichfield, for *Adrienne*.

Class 28.—*Hunter Mares, 14 stone and upwards, foaled in or before 1900.*

[No entry.]

Class 29.—*Hunter Geldings, 14 stone and upwards, foaled in or before 1900.*

[10 entries, 2 absent.]

- 190 I. (£15.)—H. M. MACKUSICK, Lyttel Hall, Nutfield, for *Tennis Ball*, bay, foaled 1897.
- 186 II. (£10.)—F. G. COLMAN, Nork Park, Epsom Downs, for *Chance*, chestnut, foaled 1897, breeder unknown.
- 188 III. (£5.)—J. P. HORNING, Comptons Lea, Horsham, for *Cavendish*, bay or brown, foaled 1898, breeder unknown.
- 189 R. N. & H. C.—H. M. MACKUSICK, for *Dublin*.

Class 30.—*Hunter Mares, under 14 stone, foaled in or before 1900.*

[No entries.]

Class 31.—*Hunter Geldings, under 14 stone, foaled in or before 1900.*

[6 entries, 1 absent.]

- 199 I. (£15.)—LORD REVELSTOKE, 7 Carlton House Terrace, S.W., for *Romeo*, chestnut, foaled 1898, breeder unknown.
- 197 II. (£10.)—H. M. MACKUSICK, Lyttel Hall, Nutfield, for *Up-to-Date*, chestnut, foaled 1899.
- 200 III. (£5.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Slingsby*, bay brown, foaled 1899.
- 196 R. N. & H. C.—H. M. MACKUSICK, for *Goldbeater*.

¹ Gold Medal, value £10 10s., given by the Hunters' Improvement Society for the best Hunter Mare four years and upwards, registered or entered in the Hunter Stud Book.

² Gold Medal, value £10 10s., given by the Hunters' Improvement Society for the best Hunter Filly not exceeding three years old, registered or entered in the Hunter Stud Book.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Cleveland Bays and Coach Horses.

Class 32.—*Cleveland Bay or Coaching Stallions, foaled in 1901 or 1902.*

[12 entries, 1 absent.]

- 205 I. (£15).—JOHN LETT, Cleveland Stud Farm, Rillington, for **Special Delight**, foaled 1902, bred by J. W. Lett, Welburn, York; s. Specialty 2302, d. Delight 826 by Touchwood.
 210 II. (£10).—F. H. STERICKER, Westgate House, Pickering, for **Garnock** 2418, foaled 1902, bred by F. J. Pettinger, Hollins Grove, Easingwold; s. Mischief 2173, d. Recherche 140 by Paragon 337.
 209 III. (£5).—GEORGE SCOBY, Beadlam Grange, Nawton, for **The Gentleman**, foaled 1901; s. Sir Dalby 2258, d. The Lady 831 by Prince George 367.
 202 R. N. & H. C.—GEORGE GRANDAGE, Thorn Bank, Bradford, for **Woodland Chief**.

Class 33.—*Cleveland Bay or Coaching Mares, with Foals at foot.*

[7 entries, none absent.]

- 219 I. (£10).—F. WILSON-HORSFALL, Potto Grange, Northallerton, for **Perseverance** 840, foaled 1897 [foal by Marquis 1407], bred by T. Jackson, Upton Hall, Whitby; s. Prince George 367, d. Trimmer 2nd 330 by Candidate 64.
 216 II. (£6).—GEORGE GRANDAGE, Thorn Bank, Bradford, for **Topsy** 843, foaled 1897 [foal by Bonny Beacon 2350], bred by John White, Appleton Roebuck, Bolton Percy; s. Lord Risby 1402, d. Anisty Queen 367 by Favourite 581.
 218 III. (£4).—H. C. STEPHENS, Cholderton, Salisbury, for **Cholderton Darling** 1106, foaled 1898 [foal by Wellington 1488]; s. Luck's All 189, d. Depper 42 by Barnaby 21.
 217 R. N. & H. C.—GEORGE SCOBY, Beadlam Grange, Nawton, for **Star of Bilsdale**.

Class 34.—*Cleveland Bay or Coaching Fillies, foaled in 1901 or 1902.*

[9 entries, none absent.]

- 228 I. (£10).—F. WILSON-HORSFALL, Potto Grange, Northallerton, for **Potto Rose** 1269, foaled 1902; s. King of the East 1525, d. Horsfall's Progress 948 by Cleveland Park 1052.
 221 II. (£6).—GEORGE GRANDAGE, Thorn Bank, Bradford, for **Lady Toft** 1205, foaled 1901, bred by George Elders Toft House Farm, Aislaby, Whitby; s. Prince George 235, d. Hetty 949 by Pitch and Toss 1204.
 220 III. (£4).—CHARLES BUTTERS, Threadneedle House, 28 Bishopsgate Street, E.C., for **Beadlam Duchess** 1171, foal 1901, bred by H. C. Stephens, Cholderton, Salisbury; s. Lorenzo 1402, d. Princess Royal 447 by Prince George 235.
 226 R. N. & H. C.—H. C. STEPHENS, for **Cholderton Princess**.

Hackneys.

Class 35.—*Hackney Stallions, foaled in 1901, 15 hands 1 inch and upwards.*

[7 entries, 2 absent.]

- 232 I. (£15, & R. N. for Champion.¹)—ARTHUR HALL, East Farm, Langton, Malton, for **Dan Leno** 8436, chestnut; s. St. Thomas 7261, d. Queen of the East 16123 by Garton Duke of Connaught 3009.
 231 II. (£10).—MRS. FLETCHER, The Grange, Angram, York, for **Angram Swell** 8058, bay; Acid Drop 6248, d. Angram Brilliance 12406 by Golden Light 2485.
 230 III. (£5).—ARTHUR FEWSON, Old Hall, Hedon, Hull, for **Hedon Prince** 8187, bay; s. Cornfactor 6313, d. Hedon Princess 2810 by North Star 1317.
 229 R. N. & H. C.—JOHN CONCHAR, Wyld Green, Birmingham, for **Warwick Paragon**.

Class 36.—*Hackney Stallions, foaled in 1902.* [7 entries, 2 absent.]

- 239 I. (£15, & Champion.¹)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Kirkburn Sensation** 8533, chestnut, bred by J. Beal, Blanch, North Dalton, Driffield; s. Rosador 4964, d. Lady Dorothy 9085 by Remus 3900.
 237 II. (£10).—MRS. F. E. COLMAN, Nork Park, Epsom Downs, for **All Serene** 8346, chestnut, bred by George Hall, East Farm, Langton, Malton; s. St. Thomas 7261, d. Lady Langmore 15948 by Langton 6078.
 240 III. (£5).—A. L. GOODSON, Heathfield, Knutsford, for **Heathfield Fireaway** 8509, chestnut, bred by Sir Gilbert Greenall, BT., Walton Hall, Warrington; s. Caxton 2398, d. Gay Dorothy 9974 by Danegelt 174.
 238 R. N. & H. C.—R. A. DE MANCHA, Waterside Stud, St. Albans, for **Royal Performer**.

¹ Champion Gold Medal given by the Hackney Horse Society for the best Hackney Stallion in Classes 35-37.

civ *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 37.—Hackney Stallions, foaled in 1903. [3 entries, 1 absent.]

- 243 I. (£10.)—ALFRED BENSON, Upper Gatton Park, Merstham, for **Copper Duke**, chestnut, bred by T. Hall, East Farm, Langton, Malton; s. Garton Duke of Connaught 3009, d. Jenny Lind 3950 *by* Matchless of Londesboro' 1517.
244 II. (£6.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Dashing Duke**, chestnut; s. Bonny Danegelt 6999, d. Garton Duchess of Connaught 6700 *by* Connaught 1453.

Class 38.—Hackney Mares, with Foals at foot, 15 hands and upwards. [5 entries, 1 absent.]

- 249 I. (£10.)—ALFRED A. HALEY, Whitewall, Malton, for **Lady Millie** 11153, chestnut, foaled 1896 [foal *by* Danegelt Royal 8117], bred by John Barker, The Grange, Bishop's Stortford; s. Agility 2799, d. Lady Mildred 9147 *by* Danegelt 174.
248 II. (£6.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Merry Cayenne** 16022, chestnut, foaled 1899 [foal *by* Brave Member 7719], bred by the late E. Smith, Benton House, Newcastle-on-Tyne; s. Royal Danegelt 5785, d. Cayenne 6468 *by* Silver Cross 1558.
246 III. (£4.)—E. J. ALLEN, Stanhill, Wilmington, Dartford, for **Lady Wilmington** 9190, black, foaled 1894 [foal *by* Garton Duke of Connaught 3009]; s. Grand Fashion 2nd 3024, d. Una 3329 *by* Canvasser 114.
247 R. N. & H. C.—ALFRED BENSON, Upper Gatton Park, for **Dainty Princess**.

Class 39.—Hackney Fillies, foaled in 1901. [3 entries.]

- 252 I. (£10, & R. N. for Champion.¹)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Gallant Girl** 15093, chestnut; s. Revival 7236, d. Titania 7502 *by* Gallant Sportsman 2075.
253 II. (£6.)—IAIN RAMSAY, Kildalton, Port Ellen, Isle of Islay, for **St. Agatha** 15400, chestnut roan, bred by J. H. Wheelwright, Rishworth, Halifax; s. Garton Duke of Connaught 3009, d. Skeleton 10511 *by* Grand Fashion 2nd 3024.
251 III. (£4.)—ALFRED BENSON, Upper Gatton Park, Merstham, for **Langton Princess**, chestnut, bred by the late J. Abram, Bryan Mills, Lockington; s. Langton 6078, d. Fanny *by* Dagenham 4214.

Class 40.—Hackney Fillies, foaled in 1902. [11 entries, 3 absent.]

- 255 I. (£10, & Champion.¹)—STEPHEN CLIFF, Wyndham Hall, Crayke, Easingwold, for **Crayke Czarina** 15715, bay, bred by T. Hodgson, Whin Hill, Ottringham; s. Cornfactor 6313, d. Halsham Topsy 13533 *by* Lord Derby 2nd 417.
259 II. (£6.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Bold Clara** 15640, chestnut; s. Royal Danegelt 5785, d. Bonnie Clara 6419 *by* Connaught 1453.
261 III. (£4.)—ALFRED A. HALEY, Whitewall, Malton, for **Maudora** 16010, bay; s. Rosador 4964, d. Lady Maude 4150 *by* Pioneer 1088.
256 R. N. & H. C.—MRS. F. E. COLMAN, Nork Park, Epsom Downs, for **Dignity of Nork**.

Ponies.

Class 41.—Pony Stallions, not exceeding 14 hands. [5 entries, 1 absent.]

- 269 I. (£10.)—THOMAS SMITH, Shirley Stud, Hall Green, near Birmingham, for **Pinderfields Horace** 7952, dark brown, foaled 1900, bred by T. P. Robinson, Pinderfields House, Wakefield; s. Sir Horace 5402, d. Lady Poma 2955 *by* Pomfret Wonder 1371.
268 II. (£6.)—O. T. PRICE, Annesley, Lyndhurst, for **Herod** 7864, dark chestnut, foaled 1899, bred by E. Baxter, Hutton Stud, Brentwood; s. Danegelt's Wonder 2nd 7421, d. Intake Wonderess 12756 *by* Little Wonder 2nd 1610.
265 III. (£4.)—CARR & CO., Clyde Vale Hackney Stud, Carlisle, N.B., for **Woodlands Eaglet** 8331, bay, foaled 1900, bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington; s. Sir Horace 5402, d. Ailsa 8622 *by* Goldfinder 6th 1791.
267 R. N. & H. C.—WALTER LLOYD, Moonhill, Cuckfield, for **Heath Hamlet**.

Class 42.—Pony Mares, with Foals at foot, not exceeding 14 hands. [4 entries, 1 absent.]

- 272 I. (£10.)—O. T. PRICE, Annesley, Lyndhurst, for **Intake Wonder** 12755, dark chestnut, foaled 1896 [foal *by* Fireboy 7440], bred by J. W. Simpson, Tuxford, Newark; s. Danegelt's Wonder 2nd 7421, d. Intake Wonderess 12756 *by* Little Wonder 2nd 1610.
273 II. (£6.)—SAM WOODIWISS, Sedgemere Stud, Great Waltham, for **Magic** 966 F.S., brown, foaled 1888 [foal *by* Fireboy 7440], bred by R. Clarke, Tacolnestone, Wymondham.

¹ Champion Gold Medal given by the Hackney Horse Society for the best Hackney Mare or Filly in Classes 38-40.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 271 III. (£4.)—ROBERT LONG, Upper Stondon, Shefford, for **Granite**, roan, foaled 1896 [foal by Prince Harpenden], bred by the Rev. G. Gainsford, Hitchin; s. Young Ethers.

Class 43.—Pony Mares, not exceeding 13 hands 2 inches, foaled in 1901 or 1902.
[3 entries.]

- 275 I. (£10.)—JOHN JONES & SON, Dinarth Hall, Colwyn Bay, for **Lady Cæsar**, bay, foaled 1902; s. Julius Cæsar 2nd 5668, d. Lexham Fanny 4224 by Gem 2082.
276 II. (£6.)—GERALD STAPYLTON-SMITH, Hutton Wood, Hutton, Essex, for **Loyal Lady** 15991, brown, foaled 1901, bred by E. Baxter, Hutton Park, Hutton; s. Dandy Ribbons 7418, d. Hutton Jubilee 1548 Inspected F.S. by Conqueror 2nd 2419.
274 III. (£4.)—G. E. FRANKLIN, The Field, Derby, for **Grand Duchess Gobang**, bay, foaled 1901; s. Sir Horace 5402, d. Lady Mabel 2210 by Denmark 177.

Shetland Ponies.

Class 44.—Shetland Pony Stallions, not exceeding 10½ hands, foaled before or in 1901. [12 entries, none absent.]

- 284 I. (£10, & Champion.¹)—R. W. R. MACKENZIE, Earlsall, Leuchars, N.B., for **Bellman** 1192, black, foaled 1900; s. Vespa 166, d. Belle of Bressay 1192 by Oman 33.
277 II. (£6.)—WALTER AITCHISON, Coniecleugh, Huntly, N.B., for **Norman**, brown, foaled 1899; s. Muness 124, d. Sunflower 1409 by Lord Violet 122.
285 III. (£4.)—R. W. R. MACKENZIE, for **Steinar**, black, foaled 1898, bred by H. F. Anderton, Vaila, Shetland; s. Duncan 147, d. Dinah 525 by Lord of the Isles 26.
282 R. N. & H. C.—THE LADIES E. & D. HOPE, Underriver, Sevenoaks, for **Haldor**.

Class 45.—Shetland Pony Colts (Entire), foaled in 1902 or 1903.²
[3 entries, 1 absent.]

- 291 I. (£5, & R. N. for Champion.¹)—R. W. R. MACKENZIE, Earlsall, Leuchars, N.B., for **Duke**, black, foaled 1902; s. Rattler 210, d. Dixie 664 by Odin 32.
290 II. (£4.)—MRS. J. R. S. MACKENZIE, Earlsall, Leuchars, N.B., for **Brigadier**, brown, foaled 1902, bred by R. W. R. Mackenzie; s. Sultan 249, d. Bracelet by Thor 83.

Class 46.—Shetland Pony Mares, not exceeding 10½ hands, foaled before or in 1901. [6 entries, 1 absent.]

- 292 I. (£10, & Champion.³)—WALTER AITCHISON, Coniecleugh, Huntly, N.B., for **Strawberry**, brown, foaled 1898, bred by the Marquis of Londonderry, K.G., Bressay, Shetland; s. Odin 32, d. Sweetie 676 by Lord of the Isles 26.
284 II. (£6, & R. N. for Champion.³)—J. & A. J. BEALE, Cacketts, Cudham, for **Topaz** 1116, black, foaled 1893, bred by the Marquis of Londonderry, K.G., Bressay, Shetland; s. Oman 33, d. Thorhilda 213 by Odin 32.
295 III. (£4.)—WILLIAM FAWCETT, The Grange, Old Bramhope, via Leeds, for **Ruby**, black, foaled 1900, bred by R. W. R. Mackenzie, Earlsall, Leuchars, N.B.; s. Bonaparte 168, d. Rebecca 1120 by Young Viscount 48.
296 R. N. & H. C.—R. W. R. MACKENZIE, Earlsall, Leuchars, N.B., for **Erna**.

Class 47.—Shetland Pony Fillies, foaled in 1902 or 1903.²
[5 entries, none absent.]

- 298 I. (£5.)—WILLIAM FAWCETT, The Grange, Old Bramhope, via Leeds, for **Midget**, black, foaled 1903; s. Mighty Atom, d. Ruby by Bonaparte 168.
299 II. (£4.)—THE LADIES E. & D. HOPE, Great Hollenden, Underriver, Sevenoaks, for **Patti**, black, foaled 1902; s. Oman 33, d. Prima Donna 989 by Jill 19.
300 III. (£3.)—THE LADIES E. & D. HOPE, for **Victoria**, brown, foaled 1902; s. Oman 33, d. Ventry 2nd 1104 by Lord of the Isles 26.
301 R. N. & H. C.—R. W. R. MACKENZIE, Earlsall, Leuchars, N.B., for **Bellwort**.

Polo and Riding Ponies.

Class 48.—Polo Pony Stallions, not exceeding 14 hands 2 inches.
[11 entries, 2 absent.]

- 303 I. (£15, & Champion.⁴)—JOHN BARKER, The Grange, Bishop's Stortford, for **Antre**, brown, foaled 1900, bred by A. O. Haslewood, Fairfield Stud, Buxton; s. Rigmorlc, d. Motilla by Veracity.

¹ Silver Medal given by the Shetland Pony Stud Book Society for the best Shetland Pony Stallion or Colt in Classes 44 and 45.

² Prizes given by the Shetland Pony Stud Book Society.

³ Silver Medal given by the Shetland Pony Stud Book Society for the best Shetland Pony Mare or Filly in Classes 46 and 47.

⁴ Champion Gold Medal given by the Polo and Riding Pony Society for the best Polo Pony Stallion in Classes 48 and 49.

cvi *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 308 **II. (£10, & R. N. for Champion.¹)**—S. H. MOORHOUSE, Stud Farm, Woodlands, Stockport, for **Rudheath** 182, bay, foaled 1893, bred by M. Gurry, Wales; s. Macheath, d. June Rose by Saraband.
 309 **III. (£5.)**—J. OSCAR MUNTZ, Goodameavy, Yelverton, for **Combination** 175, chestnut, foaled 1900, bred by Sir H. F. de Trafford, Bt., Hill Crest, Market Harboro'; s. Rosewater 37, d. Flirt 84.
 304 **R. N. & H. C.**—JOHN BARKER, for **Bold Marco**.

Class 49.—Polo Pony Stallions (Eastern Sires), not exceeding 14 hands 2 inches.² [5 entries, none absent.]

- 317 **I. (£10.)**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, Mursley, Winslow, for **Mootrub** 32, chestnut, aged.
 318 **II. (£6.)**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, for **The Bey** 108, bay, aged; s. & d. Arabs of the Tahowi breed.
 316 **III. (£4.)**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, for **Blucher** 169, grey, foaled 1897, bred by Col. E. N. Henriques; s. Blitz, d. Abjar 317.

Class 50.—Polo Pony Mares, above 13 hands 2 inches, and not exceeding 14 hands 2 inches, with Foals at foot, or to foal in 1904. [12 entries, 1 absent.]

- 319 **I. (£10, & Champion.³)**—JOHN BARKER, The Grange, Bishop's Stortford, for **Black Bella** 475, black, foaled 1889 [foal by Sandiway 121], bred by A. J. S. Johnstone; s. Blackthorne, d. by Tynedale.
 320 **II. (£6, & R. N. for Champion.³)**—JOHN BARKER, for **Echo** 1171, bay, foaled 1898 [foal by Sandiway 121], bred by J. C. De Las Casas, Tiverton; s. St. Lawrence, d. Marion by Marmion.
 321 **III. (£4.)**—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Early Dawn** 611, chestnut, aged [foal by Sandiway 121], breeder unknown.
 322 **R. N. & H. C.**—SIR WALTER GILBEY, Bt., Elsenham Hall, Essex, for **Bright Pearl**.

Class 51.—Polo Pony Mares, not exceeding 13 hands 2 inches, with Foals at foot, or to foal in 1904. [7 entries, none absent.]

- 336 **I. (£10.)**—THE RADNORSHIRE POLO & RIDING PONY CO., LTD., The Farm, Bleddfa, Llangunilo, R.S.O., for **Lady Postlip** 721, chestnut foaled 1895 [foal by Mountain Ash], bred by Stuart Forster, Postlip Hall, Winchcombe; s. Mootrub 32, d. Fatima by Mootrub 32.
 333 **II. (£6.)**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, Mursley, Winslow, for **Aristocrat**, chestnut, foaled 1901 [foal by Mootrub 32], bred by the Rev. D. B. Montefiore; s. Mootrub 32, d. Girton Girl 952.
 334 **III. (£4.)**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, for **Jeanie** 630, chestnut, aged [in foal to Mark Forard], breeder unknown.
 335 **R. N. & H. C.**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, for **Kathleen**.

Class 52.—Polo Pony Geldings or Fillies, foaled in 1901, not exceeding 14 hands 1½ inches.⁴ [5 entries, none absent.]

- 342 **I. (£7.)**—THE REV. D. B. MONTEFIORE & COL. E. N. HENRIQUES, Mursley, Winslow, for **Bridegroom**, chestnut gelding, bred by Sir H. F. De Trafford, Bt., Hill Crest, Market Harboro'; s. Eheu 219, d. Flirt 84.
 338 **II. (£5.)**—JOHN BARKER, The Grange, Bishop's Stortford, for **Emerald**, bay gelding; s. Sandway 121, d. Sappire 669.
 341 **III. (£3.)**—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Spinning Wheel**, bay filly; s. Sandiway 121, d. Catherine Wheel 696.
 340 **R. N. & H. C.**—JOHN BARKER, for **Silver Queen**.

Class 53.—Polo Pony Colts, Geldings, or Fillies, foaled in 1902, not exceeding 14 hands ½ inch.⁴ [14 entries, 1 absent.]

- 343 **I. (£7.)**—JOHN BARKER, The Grange, Bishop's Stortford, for **Jew Boy**, chestnut colt; s. Stowmarket, d. Jew 361 by Pearl Diver.
 245 **II. (£5.)**—JOHN BARKER, for **Spring Lightning**, chestnut filly; s. Sandiway 121, d. Lightning 726.
 348 **III. (£3.)**—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Tortoiseshell**, bay filly; s. Sandiway 121, d. Catherine Wheel 696.
 347 **R. N. & H. C.**—TRESHAM GILBEY, for **Rosy Dawn**.

¹ Champion Gold Medal given by the Polo and Riding Pony Society for the best Polo Pony Stallion in Classes 48 and 49.

² Prizes given by the Polo and Riding Pony Society.

³ Champion Gold Medal given by the Polo and Riding Pony Society for the best Polo Pony Mare in Classes 50 and 51.

⁴ Prizes given by the Polo and Riding Pony Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 54.—*Polo Pony Colts, Geldings, or Fillies, foaled in 1903, not exceeding 13 hands 3 inches.*¹ [9 entries, none absent.]

- 357 I. (£7.)—JOHN BARKER, The Grange, Bishop's Stortford, for *Baby Boy*, bay colt; s. Mark Forard, d. *Baby Girl* by Sandiway 121.
 362 II. (£5.)—THE REV. D. B. MONTEFFORE & COL. E. N. HENRIQUES, Mursley, Winslow, for *Carnation*, bay colt, bred by the Rev. D. B. Montefiore; s. Rudheath 182, d. Housemaid 1183.
 360 III. (£3.)—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for *Flying Buck*, bay colt; s. Rosewater 37, d. Early Dawn 611.
 359 R. N. & H. C.—JOHN BARKER, for *Silver Star*.

Harness Horses and Ponies.

Class 55.—*Mares or Geldings, of any age, 15 hands 2 inches and upwards, driven in Single Harness.* [14 entries, 4 absent.]

- 7 I. (£10, & R. N. for Champion.²)—ROBERT W. JAY, White House Farm, New Southgate, for *Towthorpe*, chestnut gelding, foaled 1898, bred by the Earl of Londesborough, Market Weighton; s. Sir Augustus, d. Fireirons.
 10 II. (£6.)—MISS ELLA S. ROSS, Beechfield, Sale, Cheshire, for *Rowton Blackthorn* 5778, black gelding, foaled 1894, bred by J. W. Macfie, Rowton Hall, Chester; s. Grand Fashion 2nd 3024, d. Blackie 1449 by King Cole 2130.
 5 III. (£4.)—MISS E. K. CUNLIFFE, Tyrrels Wood, Leatherhead, for *Sam Weller*, black chestnut gelding, bred by Tom Mitchell, The Park, Eccleshill; s. Gannymede 2076, d. Mischievous by Prince George.
 11 R. N. & H. C.—MISS ELLA S. ROSS, for *Rowton Vitalba*.

Class 56.—*Harness Mares or Geldings, of any age, under 15 hands 2 inches, driven in Single Harness.* [10 entries, 3 absent.]

- 15 I. (£10, & Champion.²)—MRS. HARTLEY BATT, 20 Westbourne Street, W., for *Heathfield Squire* 5207, chestnut gelding, foaled 1893, bred by the late Earl of Londesborough, Londesborough Park, Market Weighton; s. Wildfire 1224, d. Ophelia 1301 by Denmark 177.
 18 II. (£6.)—MRS. SOPHIA M. DIXON, The Manor House, Welford, Rugby, for *Merrian Royal Dane* 7351, chestnut gelding, foaled 1899, bred by T. Talbot Power, Mount Merrian, Blackrock, Co. Dublin; s. Royal Danegelt 5785, d. Charmer 7705.
 22 III. (£4.)—A. STRODE, Purton Court, Purton, Wilts, for *Pilot*, bay gelding.
 20 R. N. & H. C.—JOHN KERR, M.P., Gaddesden Place, Hemel Hempstead, for *Lord Burnham*.

Class 57.—*Harness Pony Mares or Geldings, of any age, not exceeding 14 hands, driven in Single Harness.* [2 entries, 1 absent.]

- 26 I. (£10.)—G. E. FRANKLIN, The Field, Derby, for *Champion Queen Gobang*, chestnut mare, foaled 1897, bred by J. Oliver, Llanwnda, Carnarvon; s. Julius Caesar 2nd 5666.

Class 58.—*Pairs of Mares or Geldings, 15 hands 2 inches and upwards, driven in Double Harness.* [7 entries, 2 absent.]

- 1 I. (£10.)—MISS E. K. CUNLIFFE, Tyrrels Wood, Leatherhead, for *Sam Weller*, black chestnut gelding, bred by Tom Mitchell, The Park, Eccleshill; s. Gannymede 2076, d. Mischievous by Prince George; and *Beckingham Gentleman*, black chestnut gelding, bred by Tom Mitchell; s. Lord Rattler 2566, d. Maggie 2275 by Cadet.
 5 II. (£6.)—MISS ELLA S. ROSS, Beechfield, Sale, Cheshire, for *Rowton Vinca* 5779, black gelding, foaled 1894, bred by J. W. Macfie, Rowton Hall, Chester; s. Grand Fashion 2nd 3024, d. Lady Verbena No. 302 Inspected F.S.; and *Rowton Blackthorn* 5778, black gelding, foaled 1894, bred by J. W. Macfie; s. Grand Fashion 2nd 3024, d. Blackie 1449 by King Cole 2130.
 4 III. (£4.)—MISS ELLA S. ROSS, for *Rowton Merrylegs* 6883, black gelding, foaled 1897, bred by J. W. Macfie, Rowton Hall, Chester; s. Rowton Blackthorn 5778, d. Rowton Marion 6115; and *Rowton Vitalba*, black gelding, foaled 1897, bred by J. W. Macfie; s. Rowton Blackthorn 5778, d. Rowton Violet 7366.
 3 R. N. & H. C.—F. A. KÖNIG, The Cottage, Chislehurst, for *Eris* and *Kenric* the Saxon.

Class 59.—*Pairs of Mares or Geldings, 15 hands 2 inches and upwards, neither of which has won a First or Second Prize at the Shows of this Society or of the following Societies:—Royal Dublin, Hackney Horse, Yorkshire, Peterborough and Richmond (Surrey). Driven in Double Harness.* [1 entry.]

- 8 I. (£10.)—MRS. DIXON, The Manor House, Welford, Rugby, for chestnut gelding, foaled 1899, bred by T. Power, Dublin; s. Royal Danegelt; and *Flatterer*, brown gelding, foaled 1897, bred by W. Burdett Coutts, Brookfield Stud, London; s. Foscobel.

¹ Prizes given by the Polo and Riding Pony Society.

² Gold Medal given by the Hackney Horse Society for the best Mare or Gelding in Classes 55-57, the produce of a registered Hackney Stallion.

cVIII Award of Live Stock Prizes at Park Royal, 1904.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 60.—*Pairs of Mares or Geldings, under 15 hands 2 inches, driven in Double Harness.* [5 entries, 2 absent.]

- 9 I. (£10.)—MRS. HARTLEY BATT, 20 Westbourne Street, W., for **Lady Wiles** 10207, bay mare, foaled 1894, bred by John Drewery, Little Hatfield, Skirlaugh, Hull; s. Saxon 2674, d. Miss Wiles 4420 by Lord Derby 2nd 417; and **Sir George**, bay gelding, foaled 1896, bred by R. G. Ingham, Hullen Edge, Elland; s. Bessemer 4138, d. Village Mirth 4852 by Landseer 2nd 2139.
- 11 II. (£6.)—JOHN KERR, M.P., Gaddesden Place, Hemel Hempstead, for **Johnnie Bother Em**, bay gelding, foaled 1897, bred by G. J. Jackson, Crossgates, Seamer, R.S.O., Yorks; s. Polonius 4931, d. by Fireaway 249; and **Lord Burnham**, bay gelding, foaled 1896, bred by G. & E. Burnham, Skeffling, Patrington, Yorks; s. Saxon 2674, d. Burnham's Lily 6446 by Connaught 1453.
- 10 III. (£4.)—MRS. CHICHESTER, Embley Park, Romsey, for **Osric**, bay gelding, foaled 1896; s. Polonius, d. Coquette; and **Surprise**, bay gelding, foaled 1897; s. Copalder Cadet, d. Fenton Lilly.

Class 61.—*Mares or Geldings, of any height, driven Tandem.*

[5 entries, 2 absent.]

- 23 I. (£10.)—MISS ELLA S. ROSS, Beechfield, Sale, Cheshire, for **Rowton Blackthorn** 5778, black gelding, foaled 1894, bred by J. W. Macfie, Rowton Hall, Chester; s. Grand Fashion 2nd 3024, d. Blackie 1449 by King Cole 2130; and **Rowton Merrylegs**, black gelding, foaled 1897, bred by J. W. Macfie; s. Rowton Blackthorn 5778, d. Rowton Marion.
- 20 II. (£6.)—MRS. HARTLEY BATT, 20 Westbourne Street, W., for **Lady Wiles** 10207, bay mare, foaled 1894, bred by John Drewery, Little Hatfield, Skirlaugh, Hull; s. Saxon 2674, d. Miss Wiles 4420 by Lord Derby 2nd 417; and **Sir George**, bay gelding, foaled 1896, bred by R. G. Ingham, Hullen Edge, Elland; s. Bessemer 4138, d. Village Mirth 4852 by Landseer 2nd 2139.
- 22 III. (£4.)—F. A. KÖNIG, The Cottage, Chislehurst, for **Eris** 12617, dark brown mare, foaled 1898, bred by Harry Livesey, Rotherfield; s. Stowmarket 6911, d. Eone 7832; and **Wymondham**, dark brown gelding, foaled 1898, bred by George Attoe, Tasburgh, Norfolk; s. Marshal Blücher 4398.

Four-in-Hand Teams.

Class 62.—*Mares or Geldings, shown in Harness with Coach.*

[6 entries, none absent.]

- 28 I. (£25.)—MISS ELLA S. ROSS, Beechfield, Sale, Cheshire, blacks.
- 26 II. (£10.)—J. B. JOEL, 34 Grosvenor Square, W., browns.
- 29 R. N. & H. C.—WILLIAM J. SMITH, 21 Little Cadogan Place, S.W., bays.

Trotting Competitions.

Class 63.—*Trotting Mares or Geldings, of any age or height, driven in a buggy or sulky against time.* [3 entries.]

- 1 I. (£10.)—LOUIS W. WINANS, 5 Grand Avenue, Hove, for **Charley B**, black gelding, bred in Canada; s. Octoroon, d. Brownie.
- 3 II. (£6.)—LOUIS W. WINANS, for **Tom Nolan**, bay gelding, bred in U.S.A.; s. General Hancock 1165, d. by Belmont.
- 2 III. (£4.)—LOUIS W. WINANS, for **Passing Belle**, bay mare, bred in East Aurora, New York, U.S.A.; s. Heir-at-Law, d. Windsweep.

CATTLE.

Shorthorns.

Class 64.—*Shorthorn Bulls, calved in 1900 or 1901.* [23 entries, 7 absent.]

- 366 I. (£10, & Champion.)—H.M. THE KING, Royal Farms, Windsor, for **Ronald** 79775, red and little white, born Dec. 25, 1900, bred by Her late Majesty Queen Victoria; s. Prince Victor 73320, d. Rose of Westmoreland 2nd by Penwarden 60012.
- 367 II. (£6.)—THOMAS ATKINSON, Redvales Farm, Bury, Lancs, for **Chewtown Victor** 6th 80686, roan, born Aug. 24, 1901, bred by G. F. King, Elm Park Farm, Chewton, Bristol; s. Bapton Victor's Champion 76084, d. Countess 33rd by Blair Athol 60367.
- 367 III. (£4.)—ROBERT TAYLOR, Pitlivelie Farm, Carnoustie, N.B., for **March** on 79357, red, born Jan. 16, 1900, bred by C. M. Cameron, Balnakyle, Munlochy, N.B.; s. Fortune 70467, d. Marchioness 15th by Merlin 54715.
- 379 R. N. & H. C.—FREDERICK PLATT, Barnby Manor, Newark, for **Blood Royal**.

¹ Champion Prize of £50 given by the Shorthorn Society for the best Shorthorn Bull in Classes 64-66.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 65.—Shorthorn Bulls, calved in 1902. [29 entries, 5 absent.]

- 399 I. (£10.)—JOHN HANDLEY, Green Head, Milnthorpe, for **Rolleston Serf** 84539, roan, born March 2, bred by Sir Oswald Mosley, Bt., Rolleston Hall, Burton-on-Trent; s. Beauty's Pride 78371, d. Serfdom by St. Serf 61746.
 393 II. (£6.)—E. M. DENNY, Bore Place, Chiddingstone, Edenbridge, for **Ascott Constellation** (vol. xlix. p. 491), roan, born July 10, bred by Leopold de Rothschild, Ascott, Leighton Buzzard; s. Silver Mint 79968, d. Grove Ursula by Cashier 68326.
 400 III. (£4.)—GEORGE HARRISON, Gainford Hall, Darlington, for **Duke of Lorn**, (vol. xlix. p. 869), red and white, born July 21, bred by the Executors of T. Stamper, Highfield House, Nunnington, York; s. Jewel Star 76919, d. Lady of Lorn by Emperor of Waterloo 29th 70377.
 407 R. N. & H. C.—D. MACLENNAN, Radnor Hall, Elstree, for **Lovat's Best**.

Class 66.—Shorthorn Bulls, calved in 1903. [36 entries, 10 absent.]

- 423 I. (£10, & R. N. for Champion¹)—LORD CALTHORPE, Elvetham Park, Winchfield, for **Elvetham Conqueror**, roan, born Jan. 9; s. Bapton Glory 76081, d. Queen of Clippers (vol. xlix. p. 421) by Crystal Prince 70221.
 439 II. (£6.)—PHILO L. MILLS, Ruddington Hall, Nottingham, for **King Christian of Denmark**, roan, born Jan. 28; s. King of Denmark 76958, d. Countess Farewell 5th (vol. xlvii. p. 628) by Best of Archers 69981.
 413 III. (£4.)—THE DUKE OF NORTHUMBERLAND, K.G., Alnwick Castle, Northumberland, for **Prince Benedict**, roan, born Feb. 26, bred by W. Bell, Ratcheugh, Alnwick; s. Major Beuedict 81595, d. Princess Millicent (vol. xlviii. p. 361) by Pride of Princes 77456.
 440 R. N. & H. C.—C. MORGAN-RICHARDSON, Noyadd Wylm, Cardigan, for **Meteor**.

Class 67.—Shorthorn Cows (in-milk), calved before or in 1900.

[11 entries, 2 absent.]

- 464 I. (£10, & Champion.²)—J. DEANE WILLIS, Bapton Manor, Codford St. Mary, Wilts, for **White Heather** (vol. xlvii. p. 850), white, born Feb. 1, 1898, in-milk, calved Dec. 7, 1903, bred by J. B. Manson, Kiblean, Old Meldrum, N.B.; s. Merry Mason 67486, d. Beauty 24th by Morton 53330.
 463 II. (£6.)—THE EARL OF POWIS, Powis Castle, Welshpool, for **Lady Sybil** (vol. xlvii. p. 649), roan, born Sept. 5, 1897, in-milk, calved Sept. 5, 1903, bred by John Morton, Skelsmergh Hall, Kendal; s. Mandarin 69062, d. Lady Mabel by Draughtsman 62387.
 454 III. (£4.)—A. F. BASSET, Tehidy, Camborne, for **Countess of Oxford 16th** (vol. xlviii. p. 351), roan, born June 3, 1899, in-milk, calved May 5, 1904, bred by W. J. Hosken, Loggans Mill, Hayle; s. Treforrest 63452, d. Countess of Oxford 13th by Duke of Tregunter 10th 54224.
 455 R. N. & H. C.—LORD CALTHORPE, Elvetham Park, for **Elvetham Harebell**.

Class 68.—Shorthorn Heifers (in-milk), calved in 1901.³ [12 entries, 1 absent.]

- 465 I. (£10.)—H.M. THE KING, Royal Farms, Windsor, for **Sylph** (vol. xlviii. p. 309), red and little white, born Feb. 28, in-milk, calved Feb. 20, 1904; s. Royal Duke 75509, d. Spruce by Volunteer 63501.
 466 II. (£6.)—JEREMIAH COLMAN, Gatton Park, Surrey, for **Hawthorn Flower**, roan, born March 7, in-milk, calved Jan. 6, 1904, bred by W. Atkinson, Overthwaite, Milnthorpe; s. Cairo 72151, d. Henrietta 4th by Baron Bloom 60653.
 472 III. (£4.)—SIDNEY HILL, Langford House, Langford, Bristol, for **Lavender Wreath 3rd**, white, born May 15, in-milk, calved Jan. 12, 1904; s. Wiltshire Victor 71883, d. Lavender Wreath (vol. xlvii. p. 523) by Captain of the Guard 58596.
 471 R. N. & H. C.—CAPT. W. B. HARRISON, Aldershaw, Lichfield, for **Malmaison**.

Class 69.—Shorthorn Heifers, calved in 1902. [21 entries, 5 absent.]

- 491 I. (£10, & R. N. for Champion.²)—H. S. LEON, Bletchley Park, Bucks, for **Roseleaf** (vol. xlix. p. 669), roan, born March 17; s. Silver Mint 79968, d. Rose 2nd by Percy 2nd.
 494 II. (£6.)—SIR OSWALD MOSLEY, Bt., Rolleston Hall, Burton-on-Trent, for **Yours Faithfully** (vol. xlix. p. 738), white, born Feb. 26; s. Beauty's Pride 78371, d. Bellaport Faithful 5th by Duke of Leicester 34th 72403.
 490 III. (£4.)—JOSEPH HARRIS, Calthwaite Hall, Carlisle, for **Duchess 136th**, roan, born Jan. 25; s. Prince Pensive 77506, d. Duchess 134th (vol. xlviii. p. 555) by Duke of Cumberland 4th 70302.
 496 R. N. & H. C.—R. TAYLOR, Pitlivie Farm, Carnoustie, for **Duchess of Pitlivie 2nd**.

¹ Champion Prize of £50 given by the Shorthorn Society for the best Shorthorn Bull in Classes 64-66.

² Champion Prize of £50 given by the Shorthorn Society for the best Shorthorn Cow or Heifer in Classes 67-70.

³ Prizes given by the Shorthorn Society.

cx Award of Live Stock Prizes at Park Royal, 1904.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 70.—*Shorthorn Heifers, calved in 1903.* [40 entries, 15 absent.]

- 531 I. (£10.)—THE EARL OF POWIS, Powis Castle, Welshpool, for *Lady Amy* 7th, roan, born Jan. 24; s. Cornish Knight 78641, d. Lady Amy 5tb (vol. xlv. p. 720) by Master Archer 70962.
 500 II. (£6.)—VISCOUNT BARING, Stratton, Micheldever, for *Lady Broadhooks* 3rd, roan, born Feb. 6; s. Franciscan 76711, d. Lady Broadhooks 2nd (vol. xlvii. p. 318) by Swarraton 73748.
 498 III. (£4.)—H. M. THE KING, Royal Farms, Windsor, for *Madeline*, roan, born Jan. 1; s. Silver Plate 75633, d. Moss Rose (vol. xlix. p. 322) by Pen-sive 67585.
 510 R. N. & H. C.—LEOPOLD DE ROTHSCHILD, Ascott, Leighton Buzzard, for *Nancy*.

Class 71.—*Shorthorn Dairy Cows (in-milk), calved before or in 1899, entered or eligible for entry in Coates's Herd Book.*¹ [12 entries, 1 absent.]

- 549 I. (£10.)—C. E. WODEHOUSE, Woolmers, Hertford, for *Coronet* 10th (vol. xlv. p. 782), red, born Feb. 22, 1895, calved Jan. 16, 1904; s. Earl of Southrop 96th 63960, d. Coronet 5th by Earl of Fawsley 16th 55660.
 547 II. (£6.)—LORD ROTHSCHILD, Tring Park, Herts., for *Tulip Leaf* (vol. xlv. p. 495), roan, born Feb. 10, 1896, calved Jan. 22, 1904, bred by George Gerrard, Offerton, Hindlip, Worcester; s. St. Blaize 69521, d. Lilla by Thurlaston Kirklevington 58218.
 544 III. (£4.)—A. B. & W. G. LITTLE, Paxcroft Farm, Trowbridge, for *White Rose* (vol. xlix. p. 674), white, born Feb. 1, 1897, calved May 19, 1904, bred by J. Little, Paxcroft Farm, Trowbridge; s. Wild Wilts 71879, d. Moss Rose by Lord Lavender 2nd 74894.
 548 R. N. & H. C.—R. SILCOCK & SONS, Poulton-le-Fylde, for *Red Daisy* 5th.

Class 72.—*Shorthorn Dairy Cows (in-milk), calved in or after 1900, entered or eligible for entry in Coates's Herd Book.*¹ [9 entries, 2 absent.]

- 551 I. (£10.)—JEREMIAH COLMAN, Gatton Park, Surrey, for *Ardfert Belle* (vol. xlvii. p. 403), roan, born March 9, 1900, calved Jan. 29, 1904, bred by the late W. T. Talbot-Crosbie, Ardfert Abbey, Ireland; s. Stephen Fitz-Lavender 73732, d. Lincoln Belle by British Hope 60415.
 554 II. (£6.)—A. B. & W. G. LITTLE, Paxcroft Farm, Trowbridge, for *Roseleaf* 2nd (vol. xlix. p. 674), red, born Sept. 3, 1901, in-milk, calved Jan. 3, 1904, bred by John Little, Paxcroft Farm; s. Vain Lord 75806, d. Rosemary by Pink Prince 75228.
 552 III. (£4.)—SIR ALEXANDER HENDERSON, BT., M.P., Buscot Park, Faringdon, for *Circe* (vol. xlvii. p. 494), roan, born Feb. 15, 1900, calved April 19, 1904, bred by A. M. Gordon, Newton, Insch, N.B.; s. Pride of Fame 73238, d. Siren by Surprise 66413.
 550 R. N. & H. C.—C. R. W. ADEANE, Babraham Hall, Cambridge, for *Lady Crystal* Bates.

Lincolnshire Red Short-horns.

N.B.—In the Lincolnshire Red Short-horn Classes, the number inserted within brackets after the name of an animal indicates that the animal is entered in Coates's Herd Book. A number without brackets indicates that the animal is registered in the Lincolnshire Red Short-horn Herd Book.

Class 73.—*Lincolnshire Red Short-horn Bulls, calved in 1900 or 1901.* [3 entries.]

- 561 I. (£10.)—EVERETT KING, Castle Farm, Northborough, Market Deeping, for *Northboro' Cromwell* 4th 2587, born Sept. 27, 1900, bred by S. & J. Crawley, Hemington Oundle; s. Baron Ormsby 3rd 26, d. Thunby Princess.
 560 II. (£6.)—R. & R. CHATTERTON, Stenigot, Lincoln, for *Head Porter* 2909, born April 7, 1900, bred by W. Chatterton, Hallington, Louth; s. Nonsuch 1292, d. Countess 2nd by Red Prince 211.
 559 III. (£4.)—JOHN BYRON, Normanby-le-Wold, Lincoln, for *Stenigot Soldier* 2655, born March 1, 1901, bred by R. & R. Chatterton, Stenigot, Lincoln; s. Sirdar 1676, d. Stenigot Daisy 5th by Red Prince 211.

Class 74.—*Lincolnshire Red Short-horn Bulls, calved in 1902.* [4 entries, none absent.]

- 562 I. (£10.)—W. J. ATKINSON, Weston St. Mary, Spalding, for *Weston Monarch* 2nd 3144, born March 12; s. Red Monarch (77605), d. Weston Charm by Pippin's Pride.
 563 II. (£6.)—JOHN LANGHAM, Stroxtun, Grantbam, for *Brandon Xmas Gift*, born Dec. 25; s. Brandon Chancellor 2121, d. by Collingwood.
 564 III. (£4.)—JOHN MARRIOTT, The West Lea, Cropwell Butler, Nottingham, for *Cropwell Red Earl* 2851, born Feb. 18; s. Lincoln Sailor 1597, d. Cropwell Beeswing by Senator 948.

¹ Prizes given by the Shorthorn Society.

² Prizes given by the Lincolnshire Red Short-horn Association.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 75.—Lincolnshire Red Short-horn Bulls, calved in 1903.¹

[6 entries, none absent.]

- 568 I. (£10.)—JOHN EVENS, Burton, Lincoln, for *Scampton Expansion*, born Jan. 28, bred by G. E. Sandars, Scampton House, Lincoln; s. Keddington Ruby 1243, d. Red Cow by Great Tom of Lincoln 392.
 566 II. (£6.)—TOM BETT, Benniworth Walk, Donington-on-Bain, Lincoln, for *Benniworth 29th* 3215, born Jan. 18; s. Red Chief 2611, d. by Benniworth Kelstern 28.
 567 III. (£4.)—R. & R. CHATTERTON, Stenigot, Lincoln, for *Stenigot Beau*, born Feb. 3; s. Wolsely 1436, d. Stenigot Belle by Comet 79.
 571 R. N. & H. C.—W. S. FOX, Potter Hanworth, Lincoln, for *Sharpshooter*.

Class 76.—Lincolnshire Red Short-horn Cows or Heifers (in-milk), calved before or in 1901. [5 entries, 1 absent.]

- 574 I. (£10.)—J. LANGHAM, Stroxtan, Grantham, for *Brandon Satellite*, born April 9, 1899, in-milk, calved July 20, 1903; s. Chancellor 332, d. Keddington by Satellite.
 575 II. (£6.)—JOHN MEASURES, Dunsby, Bourne, for S.S. 1st, born April 20, 1897, in-milk, calved Jan. 6, 1904; s. Saltfleet Sentinel 945, d. Dunsby Gem by Woolmer Count 2nd.
 572 III. (£4.)—W. J. ATKINSON, Weston St. Mary, Spalding, for *Saltfleet Favourite*, born March 10, 1901, in-milk, calved Dec. 27, 1903, bred by T. B. Freshney, South Somercotes, Louth; s. Grandad 15617, d. by Nonsuch 1292.
 576 R. N. & H. C.—JOHN SEARBY, Croft, Wainfleet, for *Stenigot Violet* 2nd.

Class 77.—Lincolnshire Red Short-horn Heifers, calved in 1902.¹

[5 entries, none absent.]

- 577 I. (£10.)—TOM BETT, Benniworth Walk, Donington-on-Bain, Lincoln, born March 23; s. Saltfleet Actor 1664, d. by Benniworth Kelstern 28.
 581 II. (£6.)—JOHN MARRIOTT, The West Lea, Cropwell Butler, Nottingham, for *Cropwell Pride* 2nd (vol. ix. p. 182), born Jan. 26; s. Birthday 1782, d. Cropwell Pride by Red Knight 924.
 580 III. (£4.)—JOHN LANGHAM, Stroxtan, Grantham, for *Brandon Ruby*, born May 23; s. Brandon Lord Chancellor 2121, d. Brandon Satellite by Bigby 319.
 579 R. N. & H. C.—CAPT. E. M. GRANTHAM, West Keal, Spilsby, for *Keal Polly*.

Class 78.—Lincolnshire Red Short-horn Heifers, calved in 1903.¹

[5 entries, none absent.]

- 586 I. (£10.)—JOHN TODD, Kirkby Green, Lincoln, for *Kirkby Nonpareil*, born March 21; s. Benniworth 4th 629, d. Nonpareil 2nd by Ludford 172.
 585 II. (£6.)—CAPT. THE HON. GERALD B. PORTMAN, Healing Manor, Grimsby, for *Healing Dorothy*, born March 24; s. Healing Champion 2919, d. Healing Tip Top by Limber Tom 829.
 582 III. (£4.)—E. H. CARTWRIGHT, Keddington Grange, Louth, for *Keddington Vanity*, born April 11; s. Vanguard 2691, d. Keddington Lassie by Keddington Lad 801.
 584 R. N. & H. C.—JOHN MARRIOTT, Cropwell Butler, for *Cropwell Gleam* 4th.

Herefords.

Class 79.—Hereford Bulls, calved in 1900 or 1901.

[6 entries, 3 absent.]

- 587 I. (£10, & Champion.²)—H.M. THE KING, Royal Farms, Windsor, for *Fire King* 22135, born Feb. 20, 1901; s. Earlsfield 19387, d. Firefly by Lollipop 16814.
 589 II. (£6, & R. N. for Champion.²)—PETER COATS, Sheepcote, Clifford, for *Holmer* 22229, born Jan. 5, 1901; s. Plunder 20250, d. Rowena 7th by Lackey 16795.
 588 III. (£4.)—PETER COATS, for *Endale* 21366, born Dec. 1, 1900; s. Commerce 19950, d. Royal Luna 2nd by Hope 13872.

Class 80.—Hereford Bulls, calved in 1902. [11 entries, 1 absent.]

- 598 I. (£10.)—ALLEN E. HUGHES, Wintercott, Leominster, for *Newtype* 23028, born Jan. 26; s. Malcolm 21575, d. Netta 5th by Clarence 6th 19316.
 593 II. (£6.)—SIR J. R. G. COTTERELL, BT, Garmons, Hereford, for *Rameses* 23100, born Feb. 19; s. Ricardo 20957, d. Rose by Letton Hardwick 16806.
 595 III. (£4.)—JAMES EDWARDS, Court House, Pembridge, for *Lively Lad* 22967, born Jan. 6, bred by T. Morris, Weston Court, Pembridge; s. Fine Lad 19414, d. Lady Mary by Monarch 2nd 11481.
 601 R. N. & H. C.—JAMES SMITH, Monkton, Hereford, for *Pirate*.

Class 81.—Hereford Bulls, calved in 1903. [28 entries, 5 absent.]

- 604 I. (£10.)—H.M. THE KING, Royal Farms, Windsor, for *Diplomatist*, born Jan. 1; s. Earlsfield 19387, d. Dainty (vol. xxxii. p. 548) by Clarence 15944.

¹ Prizes given by the Lincolnshire Red Short-horn Association.

² Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Hereford Bull in Classes 79–81.

cxii *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 618 II. (£6.)—ALLEN E. HUGHES, Wintercott, Leominster, for **Peer**, born Jan. 19; s. Malcolm 21575, d. Prissie (vol. xxx. p. 361) by Albion 15027.
 614 III. (£4.)—EDWARD FARR, Court of Noke, Pembroke, for **Rule Britannia**, born Jan. 12; s. Britisher 19261, d. Lady (vol. xxxiv. p. 331) by Prospero 16917.
 619 R. N. & H. C.—LORD LLANGATTOCK, The Hendre, Monmouth, for **Hendre Goldfinder**.

Class 82.—Hereford Cows or Heifers (in-milk), calved before or in 1901.

[11 entries, 5 absent.]

- 642 I. (£10, & **Champion**.¹)—JOHN TUDGE, Duxmoor, Craven Arms, for **Shotover** (vol. xxxiii. p. 673), born Jan. 17, 1901, in-milk, calved Nov. 22, 1903; s. Standpoint 19747, d. Satire by Clansman 12932.
 637 II. (£6.)—G. D. FABER, M.P., Rush Court, Wallingford, for **Ivy Lass** (vol. xxxiii. p. 386), born Jan. 21, 1901, in-milk, calved Feb. 29, 1904; bred by R. Green, Brook Farm, Lyonsall; s. Whittern Sovereign 20405, d. Ivy by Druid 5880.
 640 III. (£4.)—SIR CHARLES ROUSE-BOUGHTON, BT., Downton Hall, Ludlow, for **Lady Betty** (vol. xxxiv. p. 199), born March 29, 1896, in-milk, calved Jan. 1, 1904; s. Royalist 3rd 16958, d. Norah by Sovereign 12688.
 636 R. N. & H. C.—W. H. DAVIES, Claston and Livers Ocle, Hereford, for **Tiny**.

Class 83.—Hereford Heifers, calved in 1902. [13 entries, 6 absent.]

- 652 I. (£10, & R. N. for **Champion**.¹)—RICHARD PHIPPS, Buckenhill, Bromyard, for **Nonsuch** (vol. xxxiv. p. 556), born Jan. 3; s. Locarno 20797, d. Nancy by Prince 15579.
 643 II. (£6.)—H.M. THE KING, Royal Farms, Windsor, for **Empress** (vol. xxxiv. p. 144), born Jan. 3; s. Earlsfield 19387, d. Firefly by Lollipop 16814.
 649 III. (£4.)—G. D. FABER, M.P., Rush Court, Wallingford, for **Secret Service** (vol. xxxiv. p. 322), born July 16; s. Bage Protector 21167, d. Rosalie by Boniface 9600.
 651 R. N. & H. C.—RICHARD PHIPPS, for **Furious**.

Class 84.—Hereford Heifers, calved in 1903. [19 entries, 3 absent.]

- 667 I. (£10.)—ALLEN E. HUGHES, Wintercott, Leominster, for **Ivington Plum**, born Jan. 22; s. Malcolm 21575, d. Wintercott Plum 2nd (vol. xxxi. p. 423), by Nonpareil.
 659 II. (£6.)—PETER COATS, Sheepcote, Clifford, for **Dewy May**, born May 2; s. Bage Protector 21167, d. Silvia 4th (vol. xxxiv. p. 251) by Baron Grove 2nd 9544.
 673 III. (£4.)—T. R. THOMPSON, Erw'r Delyn, Penarth, for **Bonnie Violet**, born March 26, bred by W. Thomas, The Hayes, Sully, Barry, Glam.; s. King John 20114, d. Governance 4th (vol. xxxiv. p. 664) by Capitalist 18284.
 656 R. N. & H. C.—H.M. THE KING, Royal Farms, Windsor, for **Sophia**.

Devons.

Class 85.—Devon Bulls, calved in 1900 or 1901. [3 entries, 1 absent.]

- 677 I. (£10, & **Champion**.²)—J. C. WILLIAMS, Caerhays, St. Austell, for **Drosera** 4565, born April 6, 1901; s. Dramatist 4015, d. Blooming Cow 5th 14281 by Whitehall 2175.
 676 II. (£6.)—W. R. & A. TRIBLE, Halsdon Barton, Cookbury, Brandiscomer, for **Joker** 4792, born Feb. 28, 1900, bred by the Hon. Claud B. Portman, Child-Okeford Manor, Blandford; s. Bringgood's Duke 3544, d. Joy 12493 by Young English Gentleman 1869.

Class 86.—Devon Bulls, calved in 1902. [5 entries, none absent.]

- 682 I. (£10.)—J. C. WILLIAMS, Caerhays, St. Austell, for **Ficus** 4765, born May 5; s. Foxglove 4400, d. Whitstone May Blossom 13523 by Mario 2279.
 680 II. (£6.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Lord Nurthey**, born March 3, bred by J. Skinner, Nurthey, Halse, Somerset; s. Merryman 4082, d. Curly 8th by Tiverton Prince 3816.
 678 III. (£4.)—T. S. MORGAN, Whimble House, Exeter, for **Pound Mayor** 4850, born Feb. 5, bred by A. C. Skinner, Pound Farm, Bishop's Lydeard; s. Merryman 4082, d. Myrtle 65th of Pound 17141 by Masterpiece 2837.
 679 R. N. & H. C.—THE HON. CLAUD B. PORTMAN, Child-Okeford Manor, Blandford, for **Crystal Rock**.

Class 87.—Devon Bulls, calved in 1903. [10 entries, 2 absent.]

- 682 I. (£10, & R. N. for **Champion**.²)—J. C. WILLIAMS, Caerhays, St. Austell, for **Mistletoe**, born April 22; s. Dramatist 4015, d. Molly 5th 14885 by Captain 2204.
 685 II. (£6.)—SAMUEL KIDNER, Bickley, Milverton, for **Bickley Quaker**, born May 23; s. Magna Charta of Pound 4446, d. King Cole's Fairy 16899 by King Cole 3758.
 689 III. (£4.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Pound Royal**, born April 3; s. Councillor 3407, d. Rosebud 5th of Pound 16530 by Masterpiece 2857.
 683 R. N. & H. C.—H.M. THE KING, Royal Farms, Windsor, for **Warrior**.

¹ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Hereford Cow or Heifer in Classes 82-84.

² Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Devon Bull in Classes 85-87.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 88.—Devon Cows or Heifers (in-milk), calved before or in 1901.

[5 entries, none absent.]

- 696 I. (£10, & Champion.)—W. R. & A. TRIBLE, Halsdon Barton, Cookbury, Brandis-corner, for **Fern of Halsdon** 15477, born March 1, 1896, in-milk, calved Sept. 30, 1903, bred by A. Tribble, Halsdon Barton; s. Lord Blagdon 2999, d. *by* Duke of Halsdon.
- 695 II. (£6.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Curly 2nd of Pound** 14771, born March 30, 1895, in-milk, calved Feb. 4, 1904; s. Masterpiece 2837, d. *Curly* 8190 *by* Agricola 1881.
- 693 III. (£4.)—T. S. MORGAN, Whimble House, Exeter, for **Broadhorn 4th** 17729, born 1896, in-milk, calved Jan. 6, 1904, bred by G. Norman, Dinnaton, Barnstaple; s. Gay Lad 3589, d. Broadhorn 2nd 8646 *by* Young Mammoth.
- 694 R. N. & H. C.—E. C. NORRISH, Gays House, Copplestone, for **Fancy 27th**.

Class 89.—Devon Heifers, calved in 1902. [7 entries, 1 absent.]

- 702 I. (£10, & R. N. for Champion.)—B. C. SHEPHERD, Knowle Hall, Bridgwater, for **Hestercombe Leaf** 19029, born April 23, bred *by* the Hon. E. W. B. Portman, Hestercombe, Taunton; s. Hestercombe General 4213, d. Hestercombe Rose Leaf 17049 *by* Lord Passmore 9th of Pound 3917.
- 698 II. (£6.)—H. M. THE KING, Royal Farms, Windsor, for **Ruby**, born March 14; s. Quantock Bridegroom 4097, d. Whitstone Lovely 12951 *by* The Vicar 2156.
- 703 III. (£4.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Pound Curly 5th** 19068, born Jan. 20; s. Merryman 4082, d. *Curly* 4th of Pound 16519 *by* Masterpiece.
- 699 R. N. & H. C.—T. S. MORGAN, Whimble House, Exeter, for **Hestercombe Moss Rose**.

Class 90.—Devon Heifers, calved in 1903. [10 entries, 1 absent.]

- 705 I. (£10.)—H. M. THE KING, Royal Farms, Windsor, for **Dewdrop**, born Jan. 23; s. Benedictine 4141, d. Dolly 4th 13906 *by* Tempter 2nd 2153.
- 714 II. (£6.)—COL. A. F. WALTER, Bear Wood, Wokingham, for **Miss Lyddon 7th**, born Feb. 4, bred *by* R. W. C. Evered, Cridlands, Bridgwater; s. Favourite 4764, d. Miss Lyddon 6th 18817 *by* Colly's Tregothnan 3854.
- 713 III. (£4.)—COL. A. F. WALTER, for **Bear Wood Ringlet**, born Jan. 29; s. Bear Wood Rival 4341, d. Fairfield Picture 15680 *by* Gamekeeper 3438.
- 711 R. N. & H. C.—THE HON. CLAUD B. PORTMAN, for **Merrythought**.

South Devons.

Class 91.—South Devon Bulls, calved in 1900 or 1901.

[No entries.]

Class 92.—South Devon Cows or Heifers (in-milk), calved before or in 1901.

[4 entries.]

- 715 I. (£10.)—HENRY BRADBRIDGE, Pridbamsleigh, Ashburton, for **Dolly 3rd** 4033, born Feb. 25, 1900, in-milk, calved Nov. 20, 1903; s. Masher 769, d. Dolly 2nd 3375 *by* Hernalford 56.
- 716 II. (£6.)—BENJAMIN BUTLAND, Leigbam Barton, Plympton, for **Handsome** 4040, born March 27, 1900, in-milk, calved Jan. 21, 1904; s. Cromer 969, d. Beauty 1st 1000 *by* Melton.
- 717 III. (£4.)—W. P. VOSPER, Merafield, Plympton, for **Ruby 5th** 4701, born Jan. 21, 1901, in-milk, calved Feb. 15, 1904; s. Prince Edward 517, d. Ruby 2nd 2374 *by* Duke of Devon 2nd 171.
- 718 R. N. & H. C.—W. P. VOSPER, for **Una** 2nd.

Sussex.

Class 93.—Sussex Bulls, calved in 1900 or 1901. [6 entries, none absent.]

- 723 I. (£10.)—THE HON. R. P. NEVILL, Birling Manor, West Malling, for **Lord Comp** 1778, born March 6, 1900; s. Aldon 1st 1450, d. Lady Pansie 6721 *by* My Lord 1169.
- 724 II. (£6.)—A. J. THOMAS, Bargains Hill, Rodmersham, Sittingbourne, for **Prince Confidence** 2nd 1850, born Jan. 21, 1901, bred *by* the Hon. R. P. Nevill, Birling Manor, West Malling; s. Confidence 2nd 1630, d. Chickweed 7151 *by* My Lord 1169.
- 719 III. (£4.)—F. S. W. CORNWALLIS, Linton Park, Maidstone, for **Sussex** 1817, born Jan. 16, 1901; s. Lord Linton 1537, d. Princess Joan 7059 *by* Prince John 1261.
- 722 R. N. & H. C.—MRS. MONTEFIORE, Worth Park, Crawley, for **Brantridge Ensign** 4th.

¹ Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Devon Cow or Heifer in Classes 88-90.

cxiv *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 94.—*Sussex Bulls, calved in 1902.* [3 entries.]

- 726 I. (£10, & Special.¹)—THE EARL OF DERBY, K.G., Orchardmains, Tonbridge, for Mayor 1883, born Feb. 13; s. Diploma 1540, d. Meadow Sweet 7594 by Vickress 1364.
 727 II. (£6.)—JOSEPH GODMAN, Park Hatch, Godalming, for Albert 1888, born Jan. 23, bred by P. F. R. Saillard, Buchan Hill, Crawley; s. Alfred 1637, d. Honesty 11th 6604 by Lord Oxeye 954.
 725 III. (£4.)—E. E. BRABY, Drungewick Manor House, Rudgwick, for Earl of Drungewick 1875, born Jan. 3; s. Drungewick Prebble 1666, d. Drungewick Daisy 7885 by Loyalty 1531.

Class 95.—*Sussex Bulls, calved in 1903.* [7 entries, 3 absent.]

- 731 I. (£10, & Special.¹)—C. J. LUCAS, Warnham Court, Horsham, for Lord Eric 1990, born March 10; s. Alfred 1637, d. Aldon Prebble A 6056 by Red Hill Gold-dust 927.
 729 II. (£6.)—JOSEPH GODMAN, Park Hatch, Godalming, for Bonfire Prince 2nd 1975, born Jan. 17; s. Broadgauge 9th 1761, d. Bonfire 6th 6800 by Prince John 1261.
 728 III. (£4.)—THE EARL OF DERBY, K.G., Orchardmains, Tonbridge, for Protection 1969, born Jan. 2; s. Diploma 1540, d. Poppy 8201 by Buxom Rex 1611.
 733 R. N. & H. C.—LORD NORTHBOURNE, for Careless Anselm.

Class 96.—*Sussex Cows or Heifers (in-milk), calved before or in 1901.* [6 entries, 1 absent.]

- 740 I. (£10, & Special.¹)—GERALD WARDE, Tutsham Hall, West Farleigh, Maidstone, for Gaiety Girl 2nd 7198, born Feb. 4, 1896, in-milk, calved Jan. 14, 1904; s. Dog Rose 1086, d. Columbine 6th 4410 by Oxford Duke 708.
 739 II. (£6.)—A. J. THOMAS, Bargains Hill, Rodmersham, Sittingbourne, for Smeeth Prebble 5th 7983, born July 9, 1899, in-milk, calved Feb. 18, 1904, bred by F. Hobbs, Smeeth, Ashford; s. Godinton Dog Rose 1544, d. Smeeth Prebble 4th 6851 by Vulcan.
 737 III. (£4.)—THE HON. R. P. NEVILL, Birling Manor, West Malling, for Old Mayflower 8th 7435, born Jan. 4, 1897, in-milk, calved Jan. 6, 1904, bred by the late Alfred Agate, Farthing's Farm, Horsham; s. Goldlink 1099, d. Old Mayflower 5th 5340 by Ringley Knight 951.
 736 R. N. & H. C.—MRS. MONTEFIORE, Worth Park, Crawley, for Peep-bo.

Class 97.—*Sussex Heifers, calved in 1902.* [5 entries, 1 absent.]

- 745 I. (£10.)—W. F. WINCH, Tilsden, Cranbrook, for Warden Lady 9103, born Feb. 15, bred by W. J. Hawes, Wateringbury; s. Tutsham Rival 1757, d. Warden Crumple 7977 by Chatham 1508.
 744 II. (£6.)—W. F. WINCH, for Tilsden Damsel 2nd 9091, born Jan. 3; s. Buckhurst 1652, d. Aldon Damsel 1st 6665 by Headley 1201.
 743 R. N. & H. C.—LORD NORTHBOURNE, Betteshanger Park, Eastry, Kent.

Class 98.—*Sussex Heifers, calved in 1903.* [6 entries, 1 absent.]

- 751 I. (£10, & Special.¹)—GERALD WARDE, Tutsham Hall, West Farleigh, for Gaiety Girl 6th 9409, born Jan. 30; s. Tutsham Rival 1757, d. Columbine 6th 4410 by Oxford Duke 708.
 750 II. (£6.)—THE HON. R. P. NEVILL, Birling Manor, West Malling, for Ellen of Birling 9323, born March 24; s. Tutsham Oxeye 1791, d. Ellen 7211 by Oxford Duke 1st 840.
 747 III. (£4.)—THE EARL OF DERBY, K.G., Orchardmains, Tonbridge, for Moonbeam 9194, born Feb. 7; s. Diploma 1540, d. Maybud 2nd 5839 by Goldmine 823.
 749 R. N. & H. C.—THE HON. R. P. NEVILL, for Birling Chickweed.

Welsh.

Class 99.—*Welsh Bulls, calved in 1900, 1901, or 1902.* [6 entries, 1 absent.]

- 754 I. (£10.)—LORD HARLECH, Glyn, Talsarnau, for McKinley, born March 3, 1900; s. Dreyfus, d. Tulip 3rd 1143 by Ulundi 238.
 755 II. (£6.)—ROBERT ROBERTS, Brongadair, Portmadoc, for Madoc Bach 534, born Jan. 2, 1901; s. Madoc Boy 398, d. Lady.
 756 III. (£4.)—THE HON. F. G. WYNN, Glynllivon Park, Carnarvon, for The Shah, born June 6, 1902, bred by W. E. Oakeley, The Plas, Tan-y-bwlch; s. Leporello 521, d. Mair 4th 969 by Latimer 188.
 757 R. N. & H. C.—MRS. WYNNE-FINCH, Voelas, Bettws-y-coed, for Solo.

Class 100.—*Welsh Bulls, calved in 1903.* [4 entries.]

- 758 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for Wern Charger, born July 3; s. Tip 465, d. Ladysmith 1276 by Mafeking 460.

¹ Four Special Prizes of £5 5s. each given by the Sussex Herd Book Society for the First Prize Animals in Classes 94, 95, 96 and 98.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 760 II. (£6.)—O. PARRY JONES, Plas Llechylched, Bryngwran, Anglesea, for **Plas Cawryn**, born April 20; s. General French 505, d. Bodvel Queen 2nd 1205 by Bodvel Duke 267.
 761 III. (£4.)—ROBERT ROBERTS, Bronygadair, Portmadoc, for **Jerro**, born April 15; s. Kimberley 502.
 759 R. N. & H. C.—LORD HARLECH, Glyn, Talsarnau for **Tudor**.

Class 101.—*Welsh Cows or Heifers (in-milk), calved before or in 1901.*
 [5 entries; 1 absent.]

- 763 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for **Pyrites** 2nd 1190, born Jan. 3, 1898, in-milk, calved Jan. 5, 1904, bred by W. E. Oakeley, The Plas, Tan-y-bwlch; s. Hwfa 420, d. Pyrites 973 by Ardudwy 255.
 766 II. (£6.)—THE REV. J. C. WILLIAMS-ELLIS, Glasfryn, Chwillog, R.S.O., for **Glasfryn Cadie**, born 1898, in-milk, calved Jan. 14, 1904, bred by T. Parry, Pendre, Aberdaron; s. Tom, d. Nancy.
 762 III. (£4.)—THE COED CŌCH TRUSTEES, Teyrdan Farm, Colwyn Bay, for **Plas Judy** 1320, born Jan. 12, 1901, in-milk, calved Feb. 8, 1904, bred by O. Parry Jones, Plas Llechylched, Bryngwran, Anglesea; s. Plas Emperor 484.
 765 R. N. & H. C.—O. PARRY JONES, for **Plas Daisy**.

Class 102.—*Welsh Heifers, calved in 1902 or 1903.* [7 entries, 1 absent.]

- 769 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for **Wern Crocus**, born Jan. 4, 1903; s. Tip 465, d. Pyrites 2nd 1190 by Hwfa 420.
 771 II. (£6.)—O. PARRY JONES, Plas Llechylched, Bryngwran, Anglesea, for **Plas Daisy** 3rd, born March 10, 1902; s. Gold Seeker 480, d. Plas Daisy 1169.
 767 III. (£4.)—THE COED CŌCH TRUSTEES, Teyrdan Farm, Colwyn Bay, for **Cymraes O'Fadryn** 2nd, born Feb. 7, 1902, bred by Col. H. Platt, C.B., Gorddino, Llanfairfechan; s. Tan-y-bwlch Buller 515, d. Cymraes O'Fadryn 1354.
 772 R. N. & H. C.—ROBERT ROBERTS, Bronygadair, Portmadoc, for **Kitty**.

Red Polled.

Class 103.—*Red Polled Bulls, calved in 1900 or 1901.*
 [4 entries, 1 absent.]

- 775 I. (£10, & **Champion**.¹)—SIR WALTER O. CORBET, BT., Acton Reynold, Shrewsbury, for **Albert** 7789, born May 16, 1900, bred by the Hon. A. E. Fellowes, M.P., Honingham, Norwich; s. The Pope 4581, d. Annie 7642 by Starston Jew 2084.
 774 II. (£6.)—R. P. COOPER, Ashlyns, Berkhamsted, for **Royal Standard** 8707, born Jan. 26, 1900, bred by Lord Amherst of Hackney, Didlington Hall, Stoke Ferry; s. Redvers 6570, d. Jubilee Emblem by Caistor Spark 3413.
 777 III. (£4.)—SIR THOMAS V. S. GOOCH, BT., Benacre Hall, Wrentham, for **Pistol** 8558, born Jan. 19, 1900, bred by J. E. Platt, Howbury Hall, Bedford; s. Champion 5370, d. Bruna 12080 by Ruby Prince 4131.

Class 104.—*Red Polled Bulls, calved in 1902.* [10 entries, 1 absent.]

- 785 I. (£10, & R. N. for **Champion**.¹)—JOHN HAMMOND, Bale, East Dereham, for **Davys** 244th 9059, born April 27; s. Handy Man 8215, d. Davy 155th 10149 by Davyson 78th 3067.
 782 II. (£6.)—THE HON. A. E. FELLOWES, M.P., Honingham, Norwich, for **Advocate**, born Jan. 19; s. Albert 7789, d. Ardent by The Pope 4581.
 787 III. (£4.)—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Wonder** 9156, born April 14; s. Rendlesham Knight 8997, d. Wonder Pear 5181 by Eyke Wonder.
 780 R. N. & H. C.—SIR WALTER O. CORBET, BT., Acton Reynold, for **Edward**.

Class 105.—*Red Polled Bulls, calved in 1903.* [12 entries, 2 absent.]

- 789 I. (£10.)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Defender**, born May 8; s. Defiance 6966, d. Nellie 9614 by Red Shirt 2014.
 791 II. (£6.)—R. P. COOPER, Ashlyns, Berkhamsted, for **Ashlyn's Major**, born Jan. 4; s. Lord Rosebery 8383, d. Wilby by Falstaff 303.
 794 III. (£4.)—THE HON. A. E. FELLOWES, M.P., Honingham, Norwich, for **Abbot**, born Jan. 3; s. Antic 7799, d. Auburn 9969 by Young Alfred 3354.
 795 R. N. & H. C.—SIR THOMAS V. S. GOOCH, BT., for **Benacre Magician**.

¹ Champion Prize of £10 given by the Red Polled Society for the best Red Polled Bull in Classes 103-105.

cxvi *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 106.—Red Polled Cows or Heifers (in-milk), calved before or in 1901. [5 entries, 2 absent.]

- 804 I. (£10, & Champion.¹)—JOHN HAMMOND, Bale, East Dereham, for **Davy** 204th 16447, born Jan. 22, 1900, in-milk, calved Sept. 17, 1903; s. Majolini 3600, d. Davy 142nd 9254 by Davyson 78th 3067.
805 II. (£6, & R. N. for Champion.¹)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Popsey** 6th 17392, born March 19, 1900, in-milk, calved Jan. 6, 1904; s. Redvers 6570, d. Poppety 2nd 4289 by Didlington Davyson 2nd 657.
806 III. (£4.)—SIR THOMAS V. S. GOOCH, BT., Benacre Hall, Wrentham, for **Bruna** 12080, born March 29, 1897, in-milk, calved Aug. 21, 1903, bred by J. J. Colman, Easton, Norwich; s. Ruby Prince 4131, d. Brinhilda 8377 by Jupiter 2380.

Class 107.—Red Polled Heifers, calved in 1902. [9 entries, 2 absent.]

- 810 I. (£10.)—THE HON. A. E. FELLOWES, M.P., Honingham, Norwich, for **Alba**, born Feb. 8; s. Arthur 7802, d. Avon by The Pope.
808 II. (£6.)—SIR WALTER O. CORBET, BT., Acton Reynold, Shrewsbury, for **Acton Moss Rose** 18411, born April 21; s. Logan 6391, d. Miss Betsy 13916 by Planet 4579.
805 III. (£4.)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Waxlight** 2nd 18965, born Feb. 26; s. Royal Standard 8707, d. Wax Doll 2nd 9068 by Red Shirt 2014.
812 R. N. & H. C.—SIR THOMAS V. S. GOOCH, BT., for **Royal Jane**.

Class 108.—Red Polled Heifers, calved in 1903. [15 entries, none absent.]

- 819 I. (£10.)—THE HON. A. E. FELLOWES, M.P., Honingham, Norwich, for **Angelus**, born Jan. 30; s. Antic 7799, d. Madge by Champion.
818 II. (£6.)—SIR WALTER O. CORBET, BT., Acton Reynold, Shrewsbury, for **Acton Twilight**, born Jan. 27; s. Red Knight 5818, d. Hannah 13591 by Planet 4579.
817 III. (£4.)—SIR WALTER O. CORBET, BT., for **Acton Cowslip**, born Jan. 14; s. Albert 7789, d. Acton Tulip 14424 by Red Lord 5820.
820 R. N. & H. C.—THE HON. A. E. FELLOWES, M.P., for **Anthesis**.

Aberdeen Angus.

Class 109.—Aberdeen Angus Bulls, calved in 1900, 1901, or 1902.

[7 entries, none absent.]

- 833 I. (£10, & Champion.²)—R. W. HUDSON, Danesfield, Marlow, for **Knight of Danesfield** 20738, born Feb. 10, 1902; s. Governor of Abergeldie 1447, d. Queens of Haynes 5th 21880 by Monarch 2nd of Advie 11094.
832 II. (£6, & R. N. for Champion.²)—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, for **Wizard of Maisemore** 21465, born Dec. 12, 1901; s. Elate 16513, d. Wych Elm 29284 by Dale 3rd 13285.
829 III. (£4.)—SIR ROBERT ANDERSON, The Park, Dunmurry, Co. Antrim, for **Jim of Delvin** 20691, born March 28, 1902, bred by R. D. Jameson, Delvin Lodge, Balbriggan; s. Evander of St. Wolstaus 16563, d. Fame 2nd of Delvin 28670 by Captain Lucius 2nd.
831 R. N. & H. C.—J. J. CRIDLAN, for **Aachen**.

Class 110.—Aberdeen Angus Bulls, calved in 1903. [5 entries, none absent.]

- 837 I. (£10.)—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, for **Wizard 2nd of Maisemore** 22832, born Jan. 5; s. Elate 16513, d. Wych Elm 29284 by Dale 3rd 13285.
838 II. (£6.)—W. B. GREENFIELD, Haynes Park, Bedford, for **Royal Justice of Haynes** 22664, born May 7; s. Just Rover of Morlick 15605, d. Ruth's Darling 27002 by Justin-haugh 13550.
839 III. (£4.)—R. W. HUDSON, Danesfield, Marlow, for **Elate of Danesfield** 21809, born Jan. 21; s. Elate 16513, d. Queen 3rd of Poodhead 24121 by Lely 10153.
840 R. N. & H. C.—R. W. HUDSON, for **Gay Boy of Danesfield**.

Class 111.—Aberdeen Angus Cows or Heifers (in-milk), calved before or in 1901. [6 entries, 2 absent.]

- 846 I. (£10, & Champion.³)—R. W. HUDSON, Danesfield, Marlow, for **Effulgent of Danesfield** 28617, born Jan. 9, 1899, in-milk, calved Dec. 2, 1903; s. Eric Macdonald 12475, d. Effulgent 23527 by Albion 6525.

¹ Champion Prize of £10 given by the Red Polled Society for the best Red Polled Cow or Heifer in Classes 106-108.

² Gold Medal given by the English Aberdeen Angus Cattle Association for the best Animal of the opposite sex to that of the Animal awarded the Gold Medal of the Polled Cattle Society in Classes 100-112.

³ Gold Medal given by the Polled Cattle Society for the best Aberdeen Angus Animal in Classes 109-112.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 844 II. (£6, & R. N. for Champion.)—W. B. GREENFIELD, Haynes Park, Bedford; for **Darling of Haynes** 2nd 32027, born Dec. 25, 1900, in-milk, calved Dec. 4, 1903; s. **Just Rover** of Morlich 15005, d. **Darling of Flamsteadbury** 26991 by **King of Paris** 6809.
- 843 III. (£4.)—J. J. CRIDLAN, Home Farm, Maismore Park, Gloucester, for **Opening Rose** 28303, born March 14, 1899, in-milk, calved April 6, 1904, bred by W. S. Ferguson, Pictstonhill, Perth; s. **Erica Lad** 11644, d. **Blooming Rose** 21278 by **Adolphus** 8037.
- 841 R. N. & H. C.—THE REV. C. BOLDEN, Preston Bissett, Bucks, for **Elastic of Preston**.
- Class 112.—*Aberdeen Angus Heifers, calved in 1902 or 1903.*
[11 entries, 2 absent.]
- 847 I. (£10.)—J. J. CRIDLAN, Home Farm, Maismore Park, Gloucester, for **Mabel** 8th of **Knapperna** 34664, born March 5, 1902, bred by W. Stewart, Mains of Udney, Knapperna N.B.; s. **Dreyfus** 16472, d. **Mabel of Knapperna** 24805 by **Kalendar** 10962.
- 853 II. (£6.)—C. E. HUNTER, Selaby, Gainford, Darlington, for **Ruritania** 35794, born Feb. 17, 1903; s. **Examiner of Selaby** 19107, d. **Rubina** 30298 by **Crowbar** 14233.
- 852 III. (£4.)—R. W. HUDSON, Danesfield, Marlow, for **Peerless Pride** 33589, born March 28, 1902, bred by W. S. Ferguson, Pictstonhill, Perth; s. **Echador** 16496, d. **Purple Pride** 25319 by **Edric** 9110.
- 855 R. N. & H. C.—L. A. MACPHERSON, Wyrley Grove, Pelsall, for **Rose of Wyrley**.

Galloways.

- Class 113.—*Galloway Bulls, calved in 1900, 1901, or 1902.* [4 entries.]
- 860 I. (£10.)—ROBERT GRAHAM, Auchengassel, Twynholm R.S.O., N.B., for **Defiance of Kirkconnel** 8266, born March 21, 1901; s. **Gay Stanley of Harelawhill** 7122, d. **Fanny of Kirkconnel** 15304 by **Lucky Jock of Hensol** 6779.
- 858 II. (£6.)—T. BIGGAR & SONS, Chapelton, Dalbeattie, N.B., for **Excelsior** 7702, born March 23, 1900; s. **The Pathfinder** 3rd 5991, d. **Lady Soney** 3rd of **Castlemilk** 15024 by **Nestor** 2nd of **Castlemilk** 5467.
- 861 III. (£4.)—H. C. STEPHENS, Cholderton, Salisbury, for **Jasper** 8142, born April 23, 1901; s. **Rascal** 6118, d. **Nancy Chinaman** 11540 by **Chinaman** 2nd 4437.
- 859 R. N. & H. C.—THE DUKE OF BUCCLEUCH, K.G., K.T., for **Grandee**.
- Class 114.—*Galloway Bulls, calved in 1903.* [9 entries, 2 absent.]
- 867 I. (£10.)—ANDREW MONTGOMERY, Nether Hall, Castle Douglas, N.B., for **Count** 4th of **Castlemilk** 8827, born March 1, bred by Sir R. Jardine, Bt., **Castlemilk, Lockerbie, N.B.**; s. **Nugget of Castlemilk** 7681, d. **Countess of Castlemilk** 14676 by **Nestor** 2nd of **Castlemilk** 5467.
- 866 II. (£6.)—HARRY LIVESEY, Rotherfield, for **Honour Bright** 8838, born Jan. 2, bred by T. Biggar & Sons, Chapelton, Dalbeattie, N.B.; s. **Excelsior** 7702, d. **Linda** 2nd of **Hensol** 16508 by **Magnet of Castlemilk** 7056.
- 862 III. (£4.)—THE DUKE OF BUCCLEUCH, K.G., K.T., **Drumlanrig Castle, Thornhill, N.B.**, for **Agustine of Drumlanrig** 8787, born Jan. 10; s. **Earl of Annandale** 8050, d. **Pride** 7th of **Drumlanrig** 13497 by **Macdougall of Drumlanrig** 5462.
- 863 R. N. & H. C.—JOHN CUNNINGHAM, for **Chancellor of Ballyboley**.
- Class 115.—*Galloway Cows or Heifers (in-milk), calved before or in 1901.*
[9 entries, 1 absent.]
- 877 I. (£10.)—SIR ROBERT JARDINE, Bt., **Castlemilk, Lockerbie, N.B.**, for **Alice** 3rd of **Castlemilk** 16367, born March 6, 1901, in-milk, calved Jan. 1, 1904; s. **The Pathfinder** 3rd 5991, d. **Alice of Castlemilk** 14282 by **Lowlander** 2nd of **Tarbrooch** 5992.
- 873 II. (£6.)—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, N.B., for **Lady Harden** 2nd of **Durhamhill** 14354, born May 18, 1895, in-milk, calved April 19, 1904; s. **Campfollower** 5042, d. **Lady Harden of Durhamhill** 13993 by **Harden** 1151.
- 876 III. (£4.)—SIR ROBERT JARDINE, Bt., for **Alice** 2nd of **Castlemilk** 16352, born March 5, 1900, in-milk, calved Jan. 2, 1904; s. **The Pathfinder** 3rd 5991, d. **Alice of Castlemilk** 14282 by **Lowlander** 2nd of **Tarbrooch** 5992.
- 871 R. N. & H. C.—T. BIGGAR & SONS, for **Lady Stanley** 10th of **Chapelton**.
- Class 116.—*Galloway Heifers, calved in 1902 or 1903.* [9 entries, 1 absent.]
- 883 I. (£10.)—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, N.B., for **Maggie Lauder** of **Tarbrooch** 17466, born March 10, 1902; s. **Macdougall** 4th of **Tarbrooch** 6841, d. **Maggie Lauder** 3rd of **Durhamhill** 16338 by **Campfollower** 5042.
- 880 II. (£6.)—T. BIGGAR & SONS, Chapelton, Dalbeattie, N.B., for **Lady Stanley** 16th of **Chapelton** 17403, born March 7, 1902; s. **Excelsior** 7702, d. **Lady Stanley** 7th of **Chapelton** 14585 by **Mactavish** 5453.
- 881 III. (£4.)—THE DUKE OF BUCCLEUCH, K.G., K.T., **Drumlanrig Castle, Thornhill, N.B.**, for **Pride** 28th of **Drumlanrig** 17371, born Feb. 21, 1902; s. **Earl of Annandale** 8050, d. **Pride** 16th of **Drumlanrig** 15007 by **Baron Medholme of Drumlanrig** 5912.
- 887 R. N. & H. C.—SIR ROBERT JARDINE, Bt., for **Natalie of Castlemilk**.

¹ Gold Medal given by the Polled Cattle Society for the best Aberdeen Angus Animal in Classes 109-112.

cxviii Award of Live Stock Prizes at Park Royal, 1904.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Highland.

Class 117.—*Highland Bulls, calved in 1900 or 1901.* [No entries.]

Class 118.—*Highland Cows or Heifers (in-milk), calved before or in 1901.*
[5 entries, 1 absent.]

- 890 I. (£10.)—CECIL LEVESON-GOWER, Godstone, for **Ferrachan Ruadh of Airthrey** 4507, red, born March 13, 1896, in-milk, calved April 12, 1904, bred by D. Graham, Airthrey, Bridge of Allan, N.B.; s. Tag-a-Bralach 1004, d. Ferrachan Ruadh 2858 by Gille Bhuid Leo of Largie 235.
- 891 II. (£6.)—H. C. STEPHENS, Cholderton, Salisbury, for **Agnes Helen** 4257, brindled, born March 16, 1897, in-milk, calved April 15, 1904; s. Ceatharnach 642, d. Gruaigeann Chalum 1753 by Calum Riabhach of Atholl 82.
- 893 III. (£4.)—H. C. STEPHENS, for **Proisag 3rd of Cholderton** 5884, light yellow, born Jan. 2, 1901, in-milk, calved April 8, 1904; s. Ceatharnach Bhudhe 719, d. Proisag 1st of Atholl 3645 by Young Stor 699.
- 889 R. N. & H. C.—MRS. LANGDALE-KELHAM, Bourne Lodge, Boxmoor, for **Claecharan**.

Ayrshires.

Class 119.—*Ayrshire Bulls, calved in 1900, 1901, 1902, or 1903.*
[No entries.]

Class 120.—*Ayrshire Cows or Heifers (in-milk or in-calf), calved before or in 1901.* [7 entries, none absent.]

- 895 I. (£10.)—ALEXANDER CROSS, Knockdon, Maybole, N.B., for **Blood 2nd of Knockdon** 12797, brown and white, born June 1, 1899, calved July 19, 1904; s. Yellow Squire of Castlehill 2912, d. Blanch 4th of Knockdon 9199 by Private of Knockdon 2113.
- 897 II. (£6.)—LT.-COL. G. J. FERGUSON-BUCHANAN, Auchentorlie, Bowling, N.B., for **Susy 2nd**, mostly white, born April 24, 1900, in-milk, calved June 9, 1904, bred by J. Steel, High Newton, Darvel; s. Ben of Bogside 3900, d. Susy 12495.
- 896 III. (£4.)—LT.-COL. G. J. FERGUSON-BUCHANAN, for **Auchentorlie Marguerite** 17044, brown and white, born April, 1900, calved June 26, 1904, bred by C. Duncan, Little Kilmory, Rothesay, N.B.; s. McMuilliston General French 5027, d. Little Kilmory Daisy 2nd by The Laird.
- 899 R. N. & H. C.—ANDREW MITCHELL, Barcheskie, Kirkcudbright, N.B., for **Ladysmaid**.

Jerseys.

N.B.—In the Jersey Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Island Herd Book. A number without brackets indicates that the animal is registered in the English Jersey Herd Book.

Class 121.—*Jersey Bulls, calved in 1900 or 1901.* [12 entries, 4 absent.]

- 908 I. (£10.)—MRS. MCINTOSH, Havering Park, Romford, for **Brompton** 7118, whole colour, born April 2, 1900, bred by G. Baal, St. Martin's, Jersey; s. Bessie's Knight 6781, d. Berne (8297) F.S.H.C.
- 912 II. (£6.)—THE MARQUIS OF WINCHESTER, Ampot, Andover, for **Companion** 7461, whole colour, born May 5, 1901, bred by J. Le Lievre, St. Saviour's, Jersey; s. Forfarshire 7207, d. Cuckoo (5778) P.S.C. by Duc 4531.
- 907 III. (£4.)—MRS. WATSON KENNEDY, Wiveton Hall, Cley, for **Wild Cherry** 7702, whole colour, born April 6, 1901, bred by Lord Braybrooke, Audley End, Saffron Walden; s. Cherry's Duke 7135, d. Dewberry by Ethel's King George 4832.
- 903 R. N. & H. C.—L. CURRIE, Minley Manor, Farnborough, for **Golden Summer**.

Class 122.—*Jersey Bulls, calved in 1902.* [13 entries, 2 absent.]

- 922 I. (£10.)—A. MILLER-HALLETT, Goddington, Chelsfield, for **Jolly Peter**, whole colour, born Dec. 24, bred by J. A. Maret, St. Saviour's, Jersey; s. Golden Jolly 7518, d. Hearty (7465) P.S.H.C. by Uncle Peter 5727.
- 914 II. (£6.)—JOSEPH BRUTTON, 7 Princes Street, Yeovil, for **Shy Lad** (vol. xv.), whole colour, born Aug. 4, bred by G. Baal, St. Martin's, Jersey; s. Eminent 2nd 6546, d. Berne (8297) F.S.H.C.
- 920 III. (£4.)—MRS. MCINTOSH, Havering Park, Romford, for **Golden Warrior** (vol. xv.), whole colour, born July 13, bred by F. Le Brocq, St. Peter's, Jersey; s. Golden Jolly 7518, d. Daisy of Patrimoine (8229) P.S.H.C. by Devotion's Boy 6192.
- 916 R. N. & H. C.—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Gallant**.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 123.—Jersey Bulls, calved in 1903. [34 entries, 11 absent.]

- 930 I. (£10.)—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds, for **Topper**, whole colour, born Feb. 18, bred by F. W. Le Brocq, St. Heliers, Jersey; s. **Topsman** (3202), d. **Eminent's Star** (1976) P.S. by **Eminent** 2nd.
 958 II. (£6.)—THE MARQUIS OF WINCHESTER, Amport, Andover, for **Black Pearl**, black, born May 20; s. **Distinction's Fox** (vol. xv.), d. **Roselaise Pearl** (vol. xv.), imported, by **Pearl King** 7322.
 937 III. (£4.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Orchid**, whole colour, born April 18; s. **Lowlander** (vol. xv.), d. **Princess of Orange** (vol. xiv. p. 337) by **Brushwood Boy** 6802.
 952 R. N. & H. C.—LORD ROTHSCHILD, Tring Park, Herts, for **Franc Fief's Jolly**.

Class 124.—Jersey Cows or Heifers (in-milk), calved before or in 1901.
 [15 entries, 4 absent.]

- 972 I. (£10.)—LORD ROTHSCHILD, Tring Park, Herts, for **Orleans Queen** (vol. xiv. p. 328), whole colour, born Feb. 15, 1900, in-milk, calved April 20, 1904, bred by J. P. Journeaux, St. Martin's, Jersey; s. **Carnation's Crown** 6493, d. **Maid of Orleans** (6318) P.S.C. by **Golden Hero** 4857.
 970 II. (£6.)—A. MILLER-HALLETT, Goddington, Chelsfield, for **Speckled Hip** 2nd (vol. xv.), broken colour, born Jan. 20, 1900, in-milk, calved April 8, 1904, bred by P. Le Couteur, St. John's, Jersey; s. **Wellington** 7075, d. **Speckled Hip** (7911) P.S.H.C. by **Cato** 4th 6163.
 969 III. (£4.)—A. MILLER-HALLETT, for **Alfriston Gem** (vol. xi. p. 193), whole colour, born March 1, 1897, in-milk, calved April 30, 1904, bred by J. P. Pirouet, St. Owen's, Jersey; s. **Golden Lad** 3324, d. **Alfriston** 3rd (2640) P.S.H.C. by **Khediv's Bute** 3424.
 965 R. N. & H. C.—E. MURRAY IND, Coombe Lodge, Great Warley, for **Lady May**.

Class 125.—Jersey Cows or Heifers, (in-milk), calved before or in 1902, sired in either England, Scotland, Ireland, or Wales, entered or eligible for entry in the English Jersey Herd Book.¹ [15 entries, 6 absent.]

- 989 I. (£10.)—THE MARQUIS OF WINCHESTER, Amport, Andover, for **Henbury Gentle** (vol. xiii. p. 280), dark brown, born Dec. 10, 1899, in-milk, calved April 9, 1904, bred by P. D. Prankerdt, Stoke Bishop, Bristol; s. **Henbury Blackamore** 6589, d. **Gentle** 3rd by **Blackie** 5478.
 980 II. (£6.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Whitewood** 4th (vol. xi. p. 347), whole colour, born April 1, 1897, in-milk, calved May 23, 1904, bred by J. J. Shepherd, Grange-over-Sands; s. **Nelson** 5665, d. **Whitewood** 3rd by **Grey Boy** 5575.
 984 III. (£4.)—LORD ROTHSCHILD, Tring Park, Herts, for **Daystar** (vol. xi. p. 230), whole colour, born Feb. 13, 1897, in-milk, calved Dec. 22, 1903, bred by H. Padwick, Manor House, West Thorney, Emsworth; s. **Jonathan** 5600, d. **Puss** by **Bessie's Monopolist** 3080.
 978 R. N. & H. C.—W. C. COOPER, Whittlebury Lodge, Towcester, for **Deodora's Daughter** 2nd.

Class 126.—Jersey Heifers (in-milk), calved in 1902.
 [28 entries, 12 absent.]

- 1013 I. (£10.)—LORD ROTHSCHILD, Tring Park, Herts, for **Zelie** 3rd, broken colour, born Feb. 10, in-milk, calved May 28, 1904, bred by N. Du Feu, Jun., Trinity, Jersey; s. **Leda's Golden Lad** 7568, d. **Zelie** 2nd (8419) P.S.H.C. by **Golden Fern's Lad** 6236.
 992 II. (£6.)—JOSEPH BRUTTON, 7 Princes Street, Yeovil, for **Benita** 4th, brown, born Feb. 14, in-milk, calved May 12, 1904, bred by L. Le Marine, St. John's, Jersey; s. **Golden Maid's Prince** (vol. xv.), d. **Benita** (7909) P.S.H.C. by **Victor** 6008.
 1012 III. (£4.)—LORD ROTHSCHILD, for **Oxford Pride**, whole colour, born March 23, in-milk, calved April 23, 1904; s. **Oxford Brigadier** 7320, d. **Beresford Pride** (vol. viii. p. 185), imported, by **Orme** 4296.
 1014 R. N. & H. C.—G. M. SMITH, Gumley Hall, Market Harborough, for **Jersey Carol**.

Class 127.—Jersey Heifers, calved in 1903. [35 entries, 9 absent.]

- 1032 I. (£10.)—JAMES JOICEY, Poulton Priory, Fairford, for **Gloria**, whole colour, born July 20; s. **Chief Justice** 7138, d. **Havering Glorissa** 2nd (vol. xiv. p. 278) by **Havering Pride** 6265.
 1051 II. (£6.)—THE MARQUIS OF WINCHESTER, Amport, Andover, for **Margery**, broken colour, born March 21; s. **Good Friday** 6878, d. **Margery's Pet** (vol. xiv. p. 309), imported, by **Kruger** 5950.
 1030 III. (£4.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Fair Rosamond**, whole colour, born March 31, bred by the Marquis of Winchester, Amport, Andover; s. **Companion** 7461, d. **Clematis** (vol. xiv. p. 234) by **Why Nor** 7395.
 1019 R. N. & H. C.—C. W. ARMITAGE, Woodlands, Northaw, for **Mignonne's Lily**.

¹ Prizes given by the English Jersey Cattle Society.

cxx *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Guernseys.

N.B.—Unless otherwise stated, the numbers refer to the English Guernsey Herd Book.

Class 128.—*Guernsey Bulls, calved in 1900 or 1901.*

[7 entries, none absent.]

- 1057 I. (£10.)—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **Robert's Success** 1239, P.S., R.G.A.S., fawn, born Sept. 20, 1900; s. France's Masher 2nd 1102, P.S., R.G.A.S., d. Lady Roberts 2116, F.S., R.G.A.S.
 1055 II. (£6.)—J. W. MARTEL, Preel, Castel, Guernsey, for **Squire of the Sages** 2nd 1318, P.S., fawn and white, born Jan. 5, 1901, bred by A. J. Simon, Les Sages, St. Peter's-in-the-Wood, Guernsey; s. King of the Herd 1195, P.S., d. Ivy 5th 4153, P.S.
 1059 III. (£4.)—LADY TICHBORNE, Tichborne Park, Alresford, for **Golden Secret** 1569, fawn and white, born Sept. 5, 1901, bred by H. M. Ozanne, Lilyvale, Castel, Guernsey; s. Columbia 1555, d. Rose of Gold 3668, P.S., R.G.A.S.
 1058 R. N. & H. C.—HENRY THOMAS, Trevaylor Farm, Penzance, for **Cornish Lad**.

Class 129.—*Guernsey Bulls, calved in 1902.* [11 entries, 2 absent.]

- 1069 I. (£10.)—LADY TICHBORNE, Tichborne Park, Alresford, for **Itchen Fair Lad** 1578, red and white, born Aug. 10, bred by P. le Page, Naftiaux, St. Andrew's, Guernsey; s. May Boy of the Gachere 1311, P.S., R.G.A.S., d. Lady Ralls 2186, F.S., R.G.A.S.
 1064 II. (£6.)—MRS. MONTEFIORE, Worth Park, Crawley, for **Radium** (late Minette's Masher 1413, P.S., R.G.A.S.), fawn and white, born Aug. 13, bred by J. le Page, Hill Farm, St. Andrew's, Guernsey; s. Keyham 1247, P.S., R.G.A.S., d. Minette 12th 4370, P.S., R.G.A.S.
 1066 III. (£4.)—H. FITZWALTER PLUMPTRE, Goodnestone, Dover, for **His Grace** 2nd 1469, fawn and little white, born Aug. 31, bred by Lady Braybrooke, Binsted, Cambridge; s. His Grace 1304, d. Polly of La Croix 4th 4608 by Smilax 1041, P.S., R.G.A.S.
 1063 R. N. & H. C.—J. W. MARTEL, Preel, Castel, Guernsey, for **No Joke**.

Class 130.—*Guernsey Bulls, calved in 1903.* [9 entries, 2 absent.]

- 1072 I. (£10.)—W. A. GLYNN, Seagrove, Seaview, Isle of Wight, for **Roland of Seaview** 10th 1621, orange, fawn, and little white, born Aug. 8; s. Roland of Seaview 2nd 1243, d. Seaview Rose 3921.
 1079 II. (£6.)—LADY TICHBORNE, Tichborne Park, Alresford, for **Bristol** 1547, red and white, born May 27; s. Holden 3rd 1206, P.S., R.G.A.S.; s. Golden Rose 5458.
 1073 III. (£4.)—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Hayes Redpath** 1574, fawn and white, born April 12; s. Redpath 1242, d. Gulnare 4th 2690.
 1077 R. N. & H. C.—JAMES HULL, The Mount, Bartley, Totton, for **New Boy**.

Class 131.—*Guernsey Cows or Heifers (in-milk), calved before or in 1901.*

[12 entries, 4 absent.]

- 1089 I. (£10.)—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **Noble Lady** 4374, P.S., R.G.A.S., red and white, born July 6, 1894, in-milk, calved May 2, 1904, bred by P. Martel, Hunguets, St. Andrew's, Guernsey; s. Lord Stanley 835, P.S., R.G.A.S., d. Daisy of the Fauxquets 1689, F.S., R.G.A.S.
 1085 II. (£6.)—FRANK HARGREAVES, Merton Grange, Gamlingay, for **Anneville Beauty** 4342, red and white, born Jan. 13, 1897, in-milk, calved May 5, 1904, bred by E. A. Mahy, Vale, Guernsey; s. Chancellor, d. Beauty.
 1084 III. (£4.)—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Olive Branch** 5258, fawn, born April 11, 1899, in-milk, calved May 31, 1904, bred by T. Blondel, St. Saviour's, Guernsey; s. Billy, d. Olive.
 1081 R. N. & H. C.—W. A. GLYNN, Seagrove, Seaview, Isle of Wight, for **Hettie** 4th.

Class 132.—*Guernsey Heifers, calved in 1902.* [7 entries, 2 absent.]

- 1097 I. (£10.)—LADY TICHBORNE, Tichborne Park, Alresford, for **Itchen Bada** 2nd 5487, red and white, born April 7, bred by Sir H. D. Tichborne, Bart., Tichborne Park; s. May Day 1132, d. Itchen Bada 4110 by Loyal of the Hunguets.
 1093 II. (£6.)—FRANK HARGREAVES, Merton Grange, Gamlingay, for **Beauty of the Village** 2nd 6518, G.H.B., red and white, born Jan. 9, bred by Elizee Brouard, Village, St. Andrew's, Guernsey; s. Ransom 3rd, d. Beauty of the Village.
 1094 R. N. & H. C.—FRANK HARGREAVES, for **Nursling Belle**.

Class 133.—*Guernsey Heifers, calved in 1903.* [14 entries, 3 absent.]

- 1101 I. (£10.)—W. A. GLYNN, Seagrove, Seaview, Isle of Wight, for **Topsy of Seagrove** 6019, orange, fawn, and white, born June 5; s. Roland of Seaview 2nd 1243, d. Quinevere 3900.
 1100 II. (£6.)—MRS. FOWNES, The Manor House, Weston Bampfylde, Sparkford, for **Mistress Pride** 5931, red and white, born Sept. 10; s. Freedom Sly 1374, d. Pride of La Laude 5619, P.S., by Rydale 7th 1112, P.S., R.G.A.S.
 1099 III. (£4.)—MRS. FOWNES, for **Kiomi** 2nd 5864, fawn and white, born Oct. 30; s. Freedom Sly 1374, d. Kiomi 5512.
 1103 R. N. & H. C.—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Hayes Express**.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Longhorns.

Class 134.—*Longhorn Bulls, calved in 1900, 1901, or 1902.* [3 entries.]

- 1114 I. (£10.)—BARONESS KINLOSS, Stowe, Buckingham, for **Rufus** 394, mulberry red, born June 9, 1900, bred by H. Jasper Selwyn, Leek Wootton, Warwick; s. Kenilworth 317, d. Melcombe Lovely by Melcombe Conqueror 324.
 1113 II. (£6.)—MRS. M. M. CHEAPE, Bentley Manor, Redditch, for **Bentley Wonder** 373, brindle, born July 7, 1901, bred by H. Jasper Selwyn, Leek Wootton, Warwick; s. Wootton Wonder 371, d. Upton Damsel by Earl of Upton 10th 307.
 1115 III. (£4.)—W. HANSON SALE, Arden Hill, Atherstone, for **Young Bow Horn**, brindled mulberry and white, born Sept. 8, 1900, bred by J. R. Watson, South Mosses, Lamplugh, Cockermouth; s. Oxley's Stowe Duke 327, d. Bow Horn of Upton by Earl of Upton 10th 307.

Class 135.—*Longhorn Bulls, calved in 1903.*¹ [7 entries, 1 absent.]

- 1116 I. (£10.)—MRS. M. M. CHEAPE, Bentley Manor, Redditch, for **Bentley Chieftain**, brindle, born Jan. 7; s. Chieftain 378, d. Bride by Cæsar 293.
 1117 II. (£5.)—THE HON. E. A. FITZ-ROY, M.P., Fox Hill, West Haddon, Rugby, for **Robin**, brindle and white, born March 13; s. President 390, d. Rose (vol. ii.) by Warwickshire Lad 369.
 1120 R. N. & H. C.—BARONESS KINLOSS, Stowe, Buckingham, for **Thomas**.

Class 136.—*Longhorn Cows or Heifers (in-milk), calved before or in 1901.*
 [4 entries, none absent.]

- 1123 I. (£10.)—MRS. M. M. CHEAPE, Bentley Manor, Redditch, for **Dido** (vol. ii. p. 24), dark brindle, born March 24, 1899, in-milk, calved Jan. 11, 1904, bred by W. Hanson Sale, Arden Hill, Atherstone; s. Earl of Upton 11th 308, d. Fradley Beauty by The Duke 361.
 1126 II. (£6.)—W. HANSON SALE, Arden Hill, Atherstone, for **Daisy's Fairest and Best** (vol. ii. p. 21), red and white, born March 14, 1897, in-milk, calved June 5, 1904; s. Warwickshire Lad 369, d. Daisy by Peter 332.
 1124 III. (£4.)—MRS. M. M. CHEAPE, for **Polly 2nd** (vol. ii. p. 34), brindle, born March, 1897, in-milk, calved April 30, 1904, bred by H. Jasper Selwyn, Leek Wootton, Warwick; s. Pretender 2nd 334, d. Polly by Punch 345.

Class 137.—*Longhorn Heifers, calved in 1902 or 1903.*¹
 [4 entries, none absent.]

- 1127 I. (£10.)—LORD GERARD, Eastwell Park, Ashford, Kent, for **Black-eyed Susan** 2nd, black grizzle and white, born Jan. 2, 1902, bred by H. Jasper Selwyn, Leek Wootton, Warwick; s. Wootton Wonder 371, d. Black-eyed Susan (vol. iii. p. 8) by Kenilworth.
 1128 II. (£5.)—W. HANSON SALE, Arden Hill, Atherstone, for **Arden Sunbeam**, red and white, born Oct. 27, 1902; s. The Newton Bull 396, d. Barton Sunshine by Warwickshire Lad 369.
 1130 R. N. & H. C.—C. TOLLEMACHE SCOTT, Market Bosworth, for **Woodcote Countess**.

Kerries.

N.B.—In the Kerry Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Kerry Herd Book. A number without brackets indicates that the animal is registered in the English Kerry Herd Book.

Class 138.—*Kerry Bulls, calved in 1900, 1901, or 1902.*
 [9 entries, none absent.]

- 1135 I. (£10, & Champion.²)—THE DUCHESS OF NEWCASTLE, Clumber, Worksop, for **La Mancha Gordon**, born in 1901, bred by J. E. Butler, Waterville, Co. Kerry.
 1138 II. (£6.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **La Mancha Hero**, born May 20, 1902, bred by R. G. Nash, Finstown House, Lucan; s. Dermot (468), d. Lucan Lady 2nd by Lucan Caragh.
 1139 III. (£4.)—COL. V. W. B. VAN-DE WEYER, New Lodge, Windsor Forest, for **Kilmorna Duke** 2nd, born May 2, 1901, bred by G. G. Mahony, Kilmorna, Co. Kerry; s. Waterville Duke (433), d. Sheen 9th (2706), by Desmond (285).
 1133 R. N. & H. C.—G. G. MAHONY, Kilmorna, Co. Kerry, for **Gort-Sheen**.

¹ Prizes given by the Longhorn Cattle Society.

² Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best Kerry Animal in Classes 138-140, the Cup to become the property of an Exhibitor winning it three years in succession.

cxvii *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 139.—Kerry Cows or Heifers (in-milk), calved before or in 1901.

[13 entries, 1 absent.]

- 1144 I. (£10, & R. N. for Champion.¹)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Aime Cold** 510, born March, 1896, in-milk, calved May 18, 1904, breeder unknown.
 1148 II. (£6.)—THE DUCHESS OF NEWCASTLE, Clumber, Worksop, for **Hardwick Flora** 483, born April 23, 1898, in-milk, calved May 25, 1904; s. Kidmore Floral King 71, d. Sheen 5th 430 *by* The O'Dowd (112).
 1151 III. (£4.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **Patricia an Ceathramhadh** (2337), born April 13, 1896, in-milk, calved April 9, 1904, bred by Pierce Mahony, Kilmorna, Co. Kerry; s. Desmond (285), d. Patricia an Treas *by* Curoi.
 1141 R. N. & H. C.—CLIFFORD J. CORY, Llantarnam Abbey, Mon., for **Abbeyleix Prudence**.

Class 140.—Kerry Heifers, calved in 1902 or 1903.²

[9 entries, 1 absent.]

- 1154 I. (£5.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Walton Prudence** 576, born March 2, 1902; s. Marquis 3rd of Carton 108, d. Walton Pride 508 *by* Coco (384).
 1153 II. (£3.)—MURIEL, COUNTESS DE LA WARR, Old Lodge, Ashdown Forest, Uckfield, for **Buckhurst Matchgirl** 537, born March 22, 1902, bred by Robertson & Sons, Church Farm, Abraham, Cambs.; s. Earl, d. La Mancha Vesta 128.
 1157 III. (£2.)—GEORGE LL. PALMER, Lackham, Lacock, Chippenham, for **Peace** 570, born May 30, 1902; s. Bobs 98, d. Prude 222 *by* Waterville Knight 53.
 1161 R. N. & H. C.—COL. V. W. B. VAN-DE-WEYER, for **Forest Kate**.

Dexters.

N.B.—In the Dexter Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Dexter Herd Book. A number without brackets indicates that the animal is registered in the English Dexter Herd Book.

Class 141.—Dexter Bulls, calved in 1900, 1901, or 1902.

[13 entries, 2 absent.]

- 1163 I. (£10, & Champion.³)—G. J. B. CHETWYND, Park Lane Hall, Doncaster, for **Don Gentian** 244 (late Dick Swiveller), black, born March 16, 1902, bred by Mrs. E. A. Leatham, Hinton House, Brackley; s. La Mancha Dick 157, d. Little Nell 650 *by* Grandaddy 200.
 1166 II. (£6.)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Compton Darby** 345, black, born 1902, breeder unknown.
 1168 III. (£4.)—THE DUCHESS OF DEVONSHIRE, for **Compton Dignity** 287, black, born 1901, breeder unknown.
 1172 R. N. & H. C.—R. TAIT ROBERTSON, for **La Mancha What Next**.

Class 142.—Dexter Cows or Heifers (in-milk), calved before or in 1901.

[16 entries, 4 absent.]

- 1183 I. (£10, & R. N. for Champion.³)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Compton Dot** 809, black, born 1897, in-milk, calved May 5, 1904, breeder unknown.
 1180 II. (£6.)—BALDOMERO DE BERTODANO, Cowbridge House, Malmesbury, for **La Mancha Nest Egg** 94, black, born March, 1898, in-milk, calved May 12, 1904, breeder unknown.
 1182 III. (£4.)—THE DUCHESS OF DEVONSHIRE, for **Compton Daphne** 258, black, born 1900, in-milk, calved May 8, 1904, breeder unknown.
 1184 R. N. & H. C.—H. M. GIBBS, Barrow Court, Flax Bourton, for **Barrow Begum**.

Class 143.—Dexter Heifers, calved in 1902 or 1903.² [13 entries, 1 absent.]

- 1203 I. (£5.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **La Mancha Love Game**, red, born 1902, breeder unknown.
 1202 II. (£3.)—R. TAIT ROBERTSON, for **La Mancha Little Highness**, black, born Feb. 18, 1902, bred by Dr. H. J. Boyd, Hillsboro, Co. Down; s. Direen Darah.
 1192 III. (£2.)—G. J. B. CHETWYND, Park Lane Hall, Doncaster, for **Don Genista** 1090, black, born 1902, breeder unknown.
 1195 R. N. & H. C.—THE DUCHESS OF DEVONSHIRE, for **Compton Dainty Dish**.

¹ Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best Kerry animal in Classes 138-140, the Cup to become the property of an Exhibitor winning it three years in succession.

² Prizes given by the English Kerry and Dexter Cattle Society.

³ Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best Dexter animal in Classes 141-143, the Cup to become the property of an Exhibitor winning it three years in succession.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Dairy Cows.

Class 144.—*Dairy Cows, of any age, breed or cross, exceeding 900 lb. live weight.* [3 entries, 2 absent.]

1204 I. (£10.)—JOHN EVENS, Burton, Lincoln, for *Dairymaid 5th* (Sborthorn), red, born 1899, calved March 9, 1904.

Class 145.—*Dairy Cows, of any age, breed or cross, not exceeding 900 lb. live weight.* [No entry.]

Butter Tests.¹ [26 entries, 4 absent.]

(For Tabulated Results of Butter and Milk Tests, see page 167 of this Volume.)

Class 146.—*Cows, of any age, breed or cross, exceeding 900 lb. live weight.*

1231 (£10, & Silver Medal.)—DR. HERBERT WATNEY, Buckhold, Pangbourne, for *Wild Teasel 2nd* (vol. xiv. p. 374) (Jersey), whole fawn, born Oct. 27, 1899, calved Feb. 6, 1904; s. Mariette's Guenon 6325, d. Wild Teasel by Bard 2212.

1207 II. (£6.)—GROSVENOR BERRY, Chaldeans Farm, Much Hadham, for *Tiny's Daisy* (Jersey and Shortborn cross), black and white, born in Jan., 1899, calved Dec. 5, 1903; s. Tiny's Lad (Jersey) 6086.

1225 III. (£4, & Bronze Medal.)—C. A. SCOTT-MURRAY, The Manor House, Hambleden, Henley-on-Thames, for *Garantie 7th* (vol. xii. p. 267) (Jersey), broken colour, born Feb. 3, 1898, calved March 12, 1904, bred by Lord Rothschild, Tring Park, Herts; s. Oxford Duke 5314, d. Garantie 4th by Badier's Rival 3042.

Class 147.—*Cows, of any age, breed or cross, not exceeding 900 lb. live weight.*

1222 I. (£10, & Gold Medal.)—DAVID MUTTON, Triangle Jersey Farm, Plumpton, Lewes, for *Primrose Day* (vol. vi. p. 620), (Jersey), light fawn, born April 19, 1894, calved Jan. 12, 1904; s. Mango 3506, d. Victoria's Jubilee by Sbotover 2889.

1217 II. (£6.)—MRS. MCINTOSH, Havering Park, Romford, for *Fairy* (vol. xi. p. 241) (Jersey), grey, born March 5, 1896, calved Jan. 7, 1904, bred by W. Whitel, St. Martin's, Jersey; s. Duke 2093, d. Acorn 7941.

1230 III. (£4.)—DR. HERBERT WATNEY, Buckhold, Pangbourne, for *Violette* (8557) (Jersey), fawn, born 1897, calved April 27, 1904.

Milk Tests.

Class 146.

1228 (£5.²)—DR. HERBERT WATNEY, for *Red Maple* (Vol. viii. p. 115) (Jersey), grey, born July 14, 1896, calved April 28, 1904; s. Savoy 5720, d. Golden Maple by Egyptian 4535.

Class 147.

1222 (£5.²)—DAVID MUTTON, for *Primrose Day* (see Class 147).

SHEEP.

Oxford Downs.

Class 148.—*Oxford Down Shearling Rams.* [8 entries, none absent.]

1233 I. (£10.), & 1234 III. (£3.)—ALBERT BRASSEX, M.P., Heythrop Park, Chipping Norton; s. Southleigh 3524.

1236 II. (£5.), 1235 IV. (£2.³), & 1238 R. N. & H. C.—JAMES T. HOBBS, Maisey Hampton, Fairford, Glos.

Class 149.—*Pens of Three Oxford Down Ram Lambs.*

[13 entries, 1 absent.]

1245 I. (£10.)—ALBERT BRASSEX, M.P., Heythrop Park, Chipping Norton.

1246 II. (£5.)—JAMES T. HOBBS, Maisey Hampton, Fairford.

1248 III. (£3.)—ROBERT W. HOBBS, Kelmscott, Lechlade.

1250 IV. (£2.³)—JAMES HORLICK, Cowley Manor, Cbeltenham.

1241 R. N. & H. C.—GEORGE ADAMS, Wadley House, Faringdon.

¹ The English Jersey Cattle Society subscribed £30 towards the Prizes for Butter Tests in Classes 146 and 147, and gave Gold, Silver, and Bronze Medals for the three Jersey Animals entered or eligible for entry in the English Jersey Herd Book, which obtained the greatest number of points in the Butter Tests.

² Given by the English Jersey Cattle Society.

³ Fourth Prize given by the Oxford Down Sheep Breeders' Association.

cxxiv *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 150.—*Pens of Three Oxford Down Shearling Ewes, of the same Flock.*
[4 entries, 1 absent.]

- 1255 I. (£10.), & 1256 III. (£3.)—JAMES T. HOBBS, Maisey Hampton, Fairford.
1254 II. (£5.)—MISS ALICE DE ROTHSCHILD, Waddesdon Manor, Aylesbury.

Class 151.—*Pens of Three Oxford Down Ewe Lambs.*
[9 entries, none absent.]

- 1261 I. (£10.)—ALBERT BRASSEY, M.P., Heythrop Park, Chipping Norton.
1262 II. (£5.)—JAMES T. HOBBS, Maisey Hampton, Fairford.
1258 III. (£3.)—B. HOWARD ADAMS, Wadley House, Faringdon; s. Oxford Don, d. Elevator
by Hopeful.
1264 IV. (£2.1)—ROBERT W. HOBBS, Kelmescott, Lechlade.
1266 R. N. & H. C.—HUGH W. STILGOE, The Grounds, Adderbury, Banbury.

Shropshires.

Class 152.—*Shropshire Shearling Rams.* [19 entries, 2 absent.]

- 1273 I. (£10.)—R. P. COOPER, Ashlyns Hall, Berkhamsted.
1278 II. (£5.)—PHILO L. MILLS, Ruddington Hall, Nottingham.
1276 III. (£3.)—B. HOWARD MANDER, Trysull Manor, Wolverhampton; s. Wallflower
11624, d. by Montford Dreamer 7622.
1285 R. N. & H. C.—MATTHEW WILLIAMS, Whiston Hall, Albrighton, Wolverhampton.

Class 153.—*Pens of Five Shropshire Shearling Rams, of the same Flock.*²
[14 entries, 1 absent.]

- 1296 I. (£15.)—EDWARD NOCK, Harrington Hall, Shifnal.
1288 II. (£10.)—R. P. COOPER, Ashlyns Hall, Berkhamsted.
1299 III. (£5.)—MATTHEW WILLIAMS, Whiston Hall, Albrighton, Wolverhampton.
1295 R. N. & H. C.—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby

Class 154.—*Pens of Three Shropshire Ram Lambs.* [9 entries, none absent.]

- 1305 I. (£10.)—T. S. MINTON, Montford, Shrewsbury.
1301 II. (£5.)—R. P. COOPER, Ashlyns Hall, Berkhamsted.
1303 III. (£3.)—JOHN HARDING, Norton House, Shifnal.
1302 R. N. & H. C.—SIR WALTER O. CORBET, BT., Acton Reynold, Shrewsbury.

Class 155.—*Pens of Three Shropshire Shearling Ewes, of the same Flock.*
[6 entries, none absent.]

- 1310 I. (£10.), & 1309 III. (£3.)—R. P. COOPER, Ashlyns Hall, Berkhamsted.
1313 II. (£5.)—PHILO L. MILLS, Ruddington Hall, Nottingham.
1314 R. N. & H. C.—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby.

Class 156.—*Pens of Three Shropshire Ewe Lambs.* [8 entries, none absent.]

- 1321 I. (£10.)—T. S. MINTON, Montford, Shrewsbury.
1316 II. (£5.)—R. P. COOPER, Ashlyns Hall, Berkhamsted.
1318 III. (£3.)—JOHN HARDING, Norton House, Shifnal.
1322 R. N. & H. C.—EDWARD NOCK, Harrington Hall, Shifnal.

Southdowns.

Class 157.—*Southdown Two-Shear Rams.*³ [21 entries, 5 absent.]

- 1329 I. (£10.)—H. L. C. BRASSEY, Preston Hall, Aylesford, Kent, for **Cheveley Flash**, bred
by the late Col. McCalmont, Newmarket.
1341 II. (£5.)—THE DUKE OF RICHMOND AND GORDON, Goodwood, Chichester, bred
by the late Duke of Richmond and Gordon, K.G.
1325 III. (£3.)—C. R. W. ADEANE, Babraham Hall, Cambridge.
1324 R. N. & H. C.—H.M. THE KING, Sandringham.

Class 158.—*Southdown Shearling Rams.* [32 entries, 4 absent.]

- 1346 I. (£10, & **Champion**), 1344 II. (£5, & R. N. for **Champion**), & 1345 III. (£3.)—
H.M. THE KING, Sandringham.
1347 R. N. & H. C.—C. R. W. ADEANE, Babraham Hall, Cambridge.

¹ Fourth Prize given by the Oxford Down Sheep Breeders' Association.

² Prizes given by the Shropshire Sheep Breeders' Association.

³ Prizes given by the Southdown Sheep Society.

⁴ Champion Gold Medal, value £10 10s., or £10 10s. in money, given by the Southdown Sheep Society for the best Southdown Ram in Classes 157 and 158.

Southdown, Hampshire Down, and Suffolk Sheep. cxxv

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 159.—*Pens of Three Southdown Ram Lambs.* [15 entries, 1 absent.]

- 1381 I. (£10.)—H. L. C. BRASSEY, Preston Hall, Aylesford, Kent.
1384 II. (£5.)—THE EARL OF ELLESMERE, Stetchworth Park, Newmarket.
1377 III. (£3.)—C. R. W. ADEANE, Babraham Hall, Cambridge.
1387 R. N. & H. C.—EDWIN HENTY, The Grange, Ferring, Worthing.

Class 160.—*Pens of Three Southdown Shearling Ewes, of the same Flock.*
[15 entries, 3 absent.]

- 1394 I. (£10, & Silver Medal.¹)—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds.
1391 II. (£5.)—H.M. THE KING, Sandringham.
1392 III. (£3.)—H. L. C. BRASSEY, Preston Hall, Aylesford, Kent.
1396 R. N. & H. C.—JEREMIAH COLMAN, Gatton Park, Surrey.

Class 161.—*Pens of Three Southdown Ewe Lambs.* [14 entries, none absent.]

- 1411 I. (£10, & R. N. for Silver Medal.¹)—H. L. C. BRASSEY, Preston Hall, Aylesford.
1406 II. (£5.)—H.M. THE KING, Sandringham.
1407 III. (£3.)—C. R. W. ADEANE, Babraham Hall, Cambridge.
1415 R. N. & H. C.—EDWIN ELLIS, Summersbury Hall, Shalford, Surrey.

Hampshire Downs.

Class 162.—*Hampshire Down Two-Shear Rams.*² [7 entries, 2 absent.]

- 1425 I. (£10.)—H. C. STEPHENS, Cholderton, Salisbury, for **Cholderton 83rd** 5064; s. Berry Court 92nd 4058.
1421 II. (£5.)—CARY COLES, Manor House, Winterbourne Stoke, Salisbury, for **Collegan** 4760, bred by Prof. J. Wrightson, College of Agriculture, Downton.
1426 R. N. & H. C.—H. C. STEPHENS, for **Cholderton Dean**.

Class 163.—*Hampshire Down Shearling Rams.* [18 entries, 4 absent.]

- 1433 I. (£10.)—H. L. CRIPPS, Shifford, Bampton, Oxon, for **Shifford No. 16**; s. Shifford No. 6 4766.
1434 II. (£5.)—JAMES FLOWER, Chilmark, Salisbury.
1432 III. (£3.), & 1431 R. N. & H. C.—CARY COLES, Manor House, Winterbourne Stoke, Salisbury.

Class 164.—*Pens of Three Hampshire Down Ram Lambs.*
[19 entries, 2 absent.]

- 1447 I. (£10, & Champion.³)—T. FOWELL BUXTON, Waters Place, Ware.
1451 II. (£5, & R. N. for Champion.³)—JAMES FLOWER, Chilmark, Salisbury.
1463 III. (£3.)—H. C. STEPHENS, Cholderton, Salisbury.
1450 R. N. & H. C.—J. A. K. FALCONER, Long Sutton House, Winchfield.

Class 165.—*Pens of Three Hampshire Down Shearling Ewes, of the same Flock.*
[5 entries, none absent.]

- 1467 I. (£10), & 1466 II. (£5.)—JAMES FLOWER, Chilmark, Salisbury.
1465 III. (£3), & 1464 R. N. & H. C.—T. FOWELL BUXTON, Waters Place, Ware.

Class 166.—*Pens of Three Hampshire Down Ewe Lambs.*
[17 entries, 2 absent.]

- 1470 I. (£10.)—T. FOWELL BUXTON, Waters Place, Ware.
1472 II. (£5.)—H. L. CRIPPS, Shifford, Bampton, Oxon.
1473 III. (£3.)—JAMES FLOWER, Chilmark, Salisbury.
1480 R. N. & H. C.—R. L. OVEY, Badgemore, Henley-on-Thames.

Suffolks.

Class 167.—*Suffolk Two-Shear Rams.*⁴ [6 entries, 2 absent.]

- 1489 I. (£10.)—S. R. SHERWOOD, Playford, Ipswich, for **Playford Model** 7731; s. Discovery 6959.
1491 II. (£5.)—HERBERT E. SMITH, The Grange, Walton, Ipswich.
1488 III. (£3.)—THOMAS GOODCHILD, Great Yeldham Hall, Castle Hedingham, S.O., bred by J. W. Eagle, The Hall, Walton-on-Naze.
1487 R. N. & H. C.—THOMAS GOODCHILD.

¹ Silver Medal given by the Southdown Sheep Society for the best Pen of Ewes or Ewe Lambs in Classes 160 and 161.

² Prizes given by the Hampshire Down Sheep Breeders' Association.

³ Champion Prize of £10 given by the Hampshire Down Sheep Breeders' Association for the best Pen of Hampshire Down Ram Lambs or Ewe Lambs in Classes 164 and 166.

⁴ Prizes given by the Suffolk Sheep Society.

cxxvi *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 168.—*Suffolk Shearling Rams.* [8 entries, 1 absent.]

- 1498 I. (£10), & 1499 II. (£5).—HERBERT E. SMITH, The Grange, Walton, Ipswich.
 1497 III. (£3).—S. R. SHERWOOD, Playford, Ipswich, bred by the Marquis of Bristol, Ickworth Park, Bury St. Edmunds.
 1492 R. N. & H. C.—ROBERT BARCLAY, Higham, Bury St. Edmunds.

Class 169.—*Suffolk Ram Lambs.*¹ [7 entries, 1 absent.]

- 1505 I. (£10).—HERBERT E. SMITH, The Grange, Walton, Ipswich.
 1504 II. (£5).—S. R. SHERWOOD, Playford, Ipswich.
 1506 III. (£3).—SIDNEY T. TRAYLEN, Manor House, Honington, Bury St. Edmunds.
 1502 R. N. & H. C.—D. ABBOTT GREEN, Fingringhoe Hall, Colchester.

Class 170.—*Pens of Three Suffolk Ram Lambs.* [7 entries, none absent.]

- 1512 I. (£10).—HERBERT E. SMITH, The Grange, Walton, Ipswich.
 1511 II. (£5).—S. R. SHERWOOD, Playford, Ipswich.
 1513 III. (£3).—SIDNEY T. TRAYLEN, Manor House, Honington, Bury St. Edmunds.
 1508 R. N. & H. C.—THOMAS GOODCHILD, Great Yeldham Hall, Castle Hedingham, S.O.

Class 171.—*Pens of Three Suffolk Shearling Ewes, of the same Flock.* [4 entries.]

- 1515 I. (£10), & 1514 R. N. & H. C.—ROBERT BARCLAY, Higham, Bury St. Edmunds.
 1517 II. (£5).—SIDNEY T. TRAYLEN, Manor House, Honington, Bury St. Edmunds.
 1516 III. (£3).—M. G. HALE, Claydon, Suffolk.

Class 172.—*Pens of Three Suffolk Ewe Lambs.* [7 entries, none absent.]

- 1523 I. (£10).—HERBERT E. SMITH, The Grange, Walton, Ipswich.
 1522 II. (£5).—S. R. SHERWOOD, Playford, Ipswich.
 1520 III. (£3).—D. ABBOTT GREEN, Fingringhoe Hall, Colchester.
 1519 R. N. & H. C.—THOMAS GOODCHILD, Great Yeldham Hall, Castle Hedingham, S.O.

Lincolns.

Class 173.—*Lincoln Two-Shear Rams.*² [3 entries, 2 absent.]

- 1526 I. (£7, & Champion.³)—HENRY DUDDING, Riby Grove, Great Grimsby, for Riby Nocton Rise 8039; s. Riby Herald 7107.

Class 174.—*Lincoln Shearling Rams.* [15 entries, 3 absent.]

- 1541 I. (£10, & R. N. for Champion³), & 1542 III. (£3).—R. & W. WRIGHT, Nocton Heath, Lincoln.
 1530 II. (£5).—TOM CASSWELL, Pointon, Folkingham.
 1536 R. N. & H. C.—HENRY DUDDING, Riby Grove, Great Grimsby.

Class 175.—*Pens of Five Lincoln Shearling Rams, of the same Flock.*² [6 entries, 1 absent.]

- 1544 I. (£15).—TOM CASSWELL, Pointon, Folkingham.
 1548 II. (£10).—R. & W. WRIGHT, Nocton Heath, Lincoln.
 1545 III. (£5).—S. E. DEAN & SONS, Dowsby Hall, Bourne.
 1547 R. N. & H. C.—HENRY DUDDING, Riby Grove, Great Grimsby.

Class 176.—*Pens of Three Lincoln Ram Lambs.* [6 entries, 1 absent.]

- 1551 I. (£10), & 1552 R. N. & H. C.—HENRY DUDDING, Riby Grove, Great Grimsby.
 1550 II. (£5).—S. E. DEAN & SONS, Dowsby Hall, Bourne.
 1553 III. (£3).—R. & W. WRIGHT, Nocton Heath, Lincoln.

Class 177.—*Pens of Three Lincoln Shearling Ewes, of the same Flock.* [4 entries.]

- 1556 I. (£10).—HENRY DUDDING, Riby Grove, Great Grimsby.
 1558 II. (£5).—R. & W. WRIGHT, Nocton Heath, Lincoln.
 1555 III. (£3).—S. E. DEAN & SONS, Dowsby Hall, Bourne.
 1557 R. N. & H. C.—W. B. SWALLOW, Wootton Lawn, Ulceby.

Class 178.—*Pens of Three Lincoln Ewe Lambs.* [6 entries, none absent.]

- 1562 I. (£10).—HENRY DUDDING, Riby Grove, Great Grimsby.
 1564 II. (£5).—R. & W. WRIGHT, Nocton Heath, Lincoln.
 1559 III. (£3), & 1560 R. N. & H. C.—S. E. DEAN & SONS, Dowsby Hall, Bourne.

¹ Prizes given by the Suffolk Sheep Society.

² Prizes given by the Lincoln Long-wool Sheep Breeders' Association.

³ Champion Medal, value £5 5s., or £5 5s. in money, given by the Lincoln Long-wool Sheep Breeders' Association for the best Lincoln Ram in Classes 173 and 174.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 179.—*Pens of Three Lincoln Ewe Hoggets, in wool.*¹ [4 entries.]

- 1565 I. (£10), & 1566 II. (£5).—S. E. DEAN & SONS, Dowsby Hall, Bourne
1567 III. (£3).—HENRY DUDDING, Riby Grove, Great Grimsby.
1568 R. N. & H. C.—W. B. SWALLOW, Wootton Lawn, Ulceby.

Leicesters.

Class 180.—*Leicester Shearling Rams.* [6 entries, none absent.]

- 1572 I. (£10), 1574 III. (£3), & 1573 R. N. & H. C.—E. F. JORDAN, Eastburn, Driffield.
1571 II. (£5).—GEORGE HARRISON, Gainford Hall, Darlington.

Class 181.—*Pens of Three Leicester Ram Lambs.* [4 entries.]

- 1575 I. (£10).—GEORGE HARRISON, Gainford Hall, Darlington.
1576 II. (£5), & 1577 R. N. & H. C.—E. F. JORDAN, Eastburn, Driffield.
1578 III. (£3).—MRS. S. PERRY-HERRICK, Beau Manor Park, Loughborough.

Class 182.—*Pens of Three Leicester Shearling Ewes, of the same Flock.*
[6 entries, none absent.]

- 1580 I. (£10), & 1579 R. N. & H. C.—GEORGE HARRISON, Gainford Hall, Darlington.
1581 II. (£5), & 1582 III. (£3).—E. F. JORDAN, Eastburn, Driffield.

Class 183.—*Pens of Three Leicester Ewe Lambs.* [4 entries.]

- 1585 I. (£10).—GEORGE HARRISON, Gainford Hall, Darlington.
1586 II. (£5), & 1587 III. (£3).—E. F. JORDAN, Eastburn, Driffield.
1588 R. N. & H. C.—MRS. S. PERRY-HERRICK, Beau Manor Park, Loughborough.

Cotswolds.

Classes 184-187. [No entries.]

Border Leicesters.

Classes 188-191. [No entries.]

Kent or Romney Marsh.

Class 192.—*Kent or Romney Marsh Two-Shear Rams.*²
[8 entries, 1 absent.]

- 1592 I. (£10), & 1591 III. (£3).—CHARLES FILE, Elham, Canterbury.
1594 II. (£5).—FREDERICK NEAME, Macknade, Faversham.
1590 R. N. & H. C.—G. FARMER, Leeds Abbey, Maidstone, for Farmer No. 10 of 1902.

Class 193.—*Kent or Romney Marsh Shearling Rams.*
[11 entries, none absent.]

- 1604 I. (£10).—FREDERICK NEAME, Macknade, Faversham.
1606 II. (£5), & 1607 R. N. & H. C.—HENRY RIGDEN, Etchinghill, Lyminge, S.O.
1600 III. (£3).—CHARLES FILE, Elham, Canterbury.

Class 194.—*Pens of Three Kent or Romney Marsh Ram Lambs.*
[10 entries, 1 absent.]

- 1609 I. (£10).—CHARLES FILE, Elham, Canterbury.
1617 II. (£5).—THE EARL OF VERULAM, Gorhambury, St. Albans; s. Westbroke No. 4 of 1901 10697.
1615 III. (£3).—HENRY RIGDEN, Etchinghill, Lyminge, S.O.
1611 R. N. & H. C.—WILLIAM MILLEN, Syndale Valley, Faversham.

Class 195.—*Pens of Three Kent or Romney Marsh Shearling Ewes, of the same Flock.* [11 entries, 1 absent.]

- 1625 I. (£10), & 1626 III. (£3).—FREDERICK NEAME, Macknade, Faversham.
1620 II. (£5).—CHARLES FILE, Elham, Canterbury.
1627 R. N. & H. C.—HENRY RIGDEN, Etchinghill, Lyminge, S.O.

¹ Prizes given by the Lincoln Long-wool Sheep Breeders' Association.

² Prizes given by the Kent or Romney Marsh Sheep Breeders' Association.

cxxviii *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 196.—*Pens of Three Kent or Romney Marsh Ewe Lambs.* [9 entries, none absent.]

- 1631 I. (£10.)—CHARLES FILE, Elham, Canterbury.
1629 II. (£5.)—ALFRED AMOS, Spring Grove Farm, Wye.
1635 III. (£3.)—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
1634 R. N. & H. C.—FREDERICK NEAME, Macknade, Faversham.

Wensleydales.

Class 197.—*Wensleydale Shearling Rams.* [7 entries, none absent.]

- 1640 I. (£10.)—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale, for **Royal Maidstone 2nd**, bred by W. Rhodes, Lundholme, Westhouse: s. Royal Maidstone 582, d. by Marengo 499.
1644 II. (£5.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, Aysgarth, R.S.O.; s. Royal Hero 821, d. by Marengo.
1643 III. (£3.)—THE EXORS. OF THE LATE T. WILLIS; s. Royal Hero 821, d. by Royal Maidstone 582.
1639 R. N. & H. C.—LORD HENRY BENTINCK, M.P., for **Moore's Blue**.

Class 198.—*Pens of Three Wensleydale Ram Lambs.* [3 entries.]

- 1645 I. (£10.)—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale; ss. Blue Stone and Royal Maidstone 2nd.
1647 II. (£5.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, Aysgarth, R.S.O.; s. Yorkshire Champion, ds. by Royal Record 510 and Royal Maidstone 582.
1646 III. (£3.)—EDWARD HORSEMAN, Broken Briar Farm, Richmond, Yorks; s. Leyburn Double First 834, d. by Upstart 796.

Class 199.—*Pens of Three Wensleydale Shearling Ewes, of the same Flock.* [5 entries, none absent.]

- 1651 I. (£10.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, Aysgarth, R.S.O.; s. Royal York 658, ds. by Omega 506.
1648 II. (£5.)—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale; ss. King Welcome 807 and Blue Beard 607, ds. by Blue Beard 607, Beauty 603, and Winder 523.
1652 III. (£3.)—THE EXORS. OF THE LATE T. WILLIS; s. Royal Hero 821, ds. by Royal York 658 and Sensation 353.
1649 R. N. & H. C.—LORD HENRY BENTINCK, M.P.

Class 200.—*Pens of Three Wensleydale Ewe Lambs.* [3 entries.]

- 1654 I. (£10.)—EDWARD HORSEMAN, Broken Briar Farm, Richmond, Yorks; s. District Councillor 865, ds. by Leyburn Double First 834.
1653 II. (£5.)—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale; ss. Royal Maidstone 2nd and Blue Stone.
1655 III. (£3.)—RICHARD STUART, Brook Vale, Sowerby, Garstang; ss. Creditor 789 and Royal Maidstone 582, ds. by Blueskin 552 and Top Sawyer 762.

Dorset Horn.

Class 201.—*Dorset Horn Shearling Rams, dropped after November 1, 1902.* [4 entries, 1 absent.]

- 1656 I. (£10.)—E. A. HAMBRO, Milton Abbey, Blandford, for **Delcombe No. 6** 1534, born Dec. 1, 1902; s. Delcombe No. 1 1365.
1658 II. (£5.)—FRANK J. MERSON, Farrington, North Petherton, Bridgwater, born Dec., 1902.
1659 III. (£3.)—ALFRED READ, Hilton, Blandford, for **Hilton Glory**, born Dec. 6, 1902.

Class 202.—*Pens of Three Dorset Horn Ram Lambs, dropped after November 1, 1903.* [7 entries, 1 absent.]

- 1663 I. (£10.)—W. R. FLOWER, West Stafford, Dorchester, born Dec. 12, 1903; s. Flower's No. 101 1440, d. by Nynhead No. 10 1202.
1660 II. (£5.)—JAMES ATTRILL, Waytes Court, Brighstone, Isle of Wight, born Dec. 1.
1662 III. (£3.)—W. R. FLOWER, born Dec. 2, 1903; s. Flower's No. 107, d. by Flower's No. 55.
1664 R. N. & H. C.—E. A. HAMBRO, Milton Abbey, Blandford.

Class 203.—*Pens of Three Dorset Horn Shearling Ewes, of the same Flock, dropped after November 1, 1902.* [6 entries, 1 absent.]

- 1669 I. (£10. & **Champion**¹), & 1670 II. (£5.)—E. A. HAMBRO, Milton Abbey, Blandford, born Dec. 1, 1902; s. Delcombe No. 1 1365.
1667 III. (£3.)—JAMES ATTRILL, Waytes Court, Brighstone, Isle of Wight, born Dec. 11.
1672 R. N. & H. C.—FRANK J. MERSON, Farrington, North Petherton, Bridgwater.

¹ Champion Prize of £10 given by the Dorset Horn Sheep Breeders' Association for the best Pen of Ram Lambs, Shearling Ewes or Ewe Lambs in Classes 202-204.

Devon, Dartmoor, Exmoor, and Cheviot Sheep. cxxix

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 204.—*Pens of Three Dorset Horn Ewe Lambs, dropped after November 1, 1903.* [8 entries, 1 absent.]

1674 **I.** (£10, & **R. N. for Champion**¹), & 1673 **III.** (£3.)—JAMES ATTRILL, Waytes Court Brighstone, Isle of Wight, born Dec. 1, 1903.

1677 **II.** (£5.)—W. R. FLOWER, West Stafford, Dorchester, born Dec. 12, 1903; s. Flower's No. 101 1440, d. by Nynhead No. 10 1202.

1676 **R. N. & H. C.**—W. R. FLOWER.

Devon Long Wool.

Class 205.—*Devon Long Wool Rams, Shearling and upwards.* [4 entries.]

1684 **I.** (£10.)—F. WHITE, Torweston, Williton, Somerset, born Feb., 1903; s. Kruger.

1681 **II.** (£5.)—W. GREENWAY, Manor Farm, Halse, Somerset, born Feb. 8, 1903; s. Bengal.

1682 **III.** (£3.)—E. C. NORRISH, Gays House, Copplestone, born Jan. 27, 1903.

1683 **R. N. & H. C.**—A. C. SKINNER, Pound Farm, Bishop's Lydeard.

Class 206.—*Pens of Three Devon Long Wool Shearling Ewes, of the same Flock.* [3 entries, 1 absent.]

1687 **I.** (£10.)—FREDERICK WHITE, Torweston, Williton, Somerset.

1685 **II.** (£5.)—WILLIAM GREENWAY, Manor Farm, Halse, Somerset; s. Bengal.

Dartmoors.

Class 207.—*Dartmoor Rams, Shearling and upwards.* [3 entries.]

1688 **I.** (£10.)—HENRY J. KINGWELL, Great Aish, South Brent, for **Brent Up-to-Date**, born Feb. 25, 1903, bred by John R. T. Kingwell, Great Aish; s. Corrector, d. Mrs. Jeffrey by Curley.

1689 **II.** (£5.)—JOHN R. T. KINGWELL, Great Aish, South Brent, for **Brent Tip-Top**, born March 1, 1903; s. Corrector, d. Cardiff by Devon Champion.

1690 **III.** (£3.)—W. G. KINGWELL, Great Aish, South Brent, for **Brent Star**, born March 2, 1903, bred by John R. T. Kingwell, Great Aish; s. Corrector, d. Beauty by Northey.

Class 208.—*Pens of Three Dartmoor Shearling Ewes, of the same Flock.* [3 entries.]

1692 **I.** (£10.)—JOHN R. T. KINGWELL, Great Aish, South Brent; s. Corrector.

1691 **II.** (£5.)—HENRY J. KINGWELL, Great Aish, South Brent, bred by John R. T. Kingwell, Great Aish; s. Corrector.

1693 **III.** (£3.)—WILLIAM G. KINGWELL, Great Aish, South Brent, bred by John R. T. Kingwell, Great Aish; s. Corrector.

Exmoor.

Class 209.—*Exmoor Rams, Shearling and upwards.* [3 entries, 1 absent.]

1695 **I.** (£10.)—CHARLES N. SKINNER, Hawkhurst, Bridgwater, born April 1, 1902.

1696 **III.** (£3.)—FREDERICK S. YENDELL, Nadrid, South Molton, born 1901, bred by Hugh Buckingham, Lambscombe, North Molton.

Class 210.—*Pens of Three Exmoor Shearling Ewes, of the same Flock.* [3 entries.]

1698 **I.** (£10.)—CHARLES N. SKINNER, Hawkhurst, Bridgwater.

1699 **II.** (£5.)—FREDERICK S. YENDELL, Nadrid, South Molton, bred by C. N. Skinner, Hawkhurst, Bridgwater.

1697 **III.** (£3.)—HUGH BUCKINGHAM, Lambscombe Farm, North Molton.

Cheviots.

Class 211.—*Cheviot Rams, Shearling and upwards.*

[5 entries, none absent.]

1704 **I.** (£10.)—JOHN ROBSON, JUN., Allerybank, Bellingham, born April, 1902, bred by John Robson, Duns, N.B.

1701 **II.** (£5.)—JACOB ROBSON, Byrness, Otterburn, for **Prince Charming**, born April, 1901, bred by George Douglas, Upper Hindhope, Jedburgh, N.B.

1702 **III.** (£3.)—JACOB ROBSON, born April, 1902.

1703 **R. N. & H. C.**—JOHN ROBSON, Newton, Bellingham.

¹ Champion Prize of £10 given by the Dorset Horn Sheep Breeders' Association for the best Pen of Ram Lambs, Shearling Ewes or Ewe Lambs in Classes 202-204.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 212.—*Pens of Three Cheviot Shearling Ewes, of the same Flock.* [4 entries.]

1705 **I.** (£10.) & 1706 **III.** (£3.)—JACOB ROBSON, Byrness, Otterburn.

1707 **II.** (£5.)—JOHN ROBSON, Newton, Bellingham.

1708 **R. N. & H. C.**—JOHN ROBSON, JUN., Allerybank, Bellingham.

Black-Faced Mountain.

Class 213.—*Black-faced Mountain Rams, Shearling and upwards.* [5 entries, none absent.]

1710 **I.** (£10.)—JOHN DARGUE, Burneside Hall, Kendal, born April, 1902, bred by J. Hamilton, Woolfords, Cobscook.

1712 **II.** (£5.)—JOHN ROBSON, Newton, Bellingham, born April, 1902.

1713 **III.** (£3.)—JOHN ROBSON, JUN., Allerybank, Bellingham, born April, 1903, bred by John Robson, Newton, Bellingham.

1711 **R. N. & H. C.**—JOHN ROBSON, Newton, Bellingham.

Class 214.—*Pens of Three Black-faced Mountain Shearling Ewes, of the same Flock.* [4 entries.]

1714 **I.** (£10.)—JOHN DARGUE, Burneside Hall, Kendal; s. Barnum.

1715 **II.** (£5.)—JOHN ROBSON, Newton, Bellingham.

1716 **III.** (£3.)—JOHN ROBSON, JUN., Allerybank, Bellingham, bred by John Robson, Newton, Bellingham.

1717 **R. N. & H. C.**—F. H. D. C. WHITMORE, Orsett Hall, Grays.

Lonks.

Class 215.—*Lonk Rams, Shearling and upwards.* [6 entries, none absent.]

1721 **I.** (£10.)—JAMES BRIDGE, Balladen, Rawtenstall, for **Lord Nelson**, born March 31, 1903, bred by John Cock, Gib Hill Farm, Nelson.

1720 **II.** (£5.)—JOHN BLACKBURN, Deerplay Hotel, Bacup, for **Deerplay Boy**, born March 26, 1903; s. Perfection.

1722 **III.** (£3.)—JOHN HAGUE, Lamb Roe, Whalley, born March, 1901, bred by John Cock, Gib Hill Farm, Nelson.

1723 **R. N. & H. C.**—THOMAS OGDEN, Cowpe House, Waterfoot, Manchester.

Class 216.—*Pens of Three Lonk Shearling Ewes, of the same Flock.* [5 entries, none absent.]

1725 **I.** (£10.)—JOHN BLACKBURN, Deerplay Hotel, Bacup; s. Perfection.

1727 **II.** (£5.)—DAVID HAGUE, Spread Eagle Hotel, Whalley.

1728 **III.** (£3.)—JOHN HAGUE, Lamb Roe, Whalley.

1726 **R. N. & H. C.**—SMITH GOTT, Alderhurst End Farm, Trawden, Colne.

Herdwicks.

Class 217.—*Herdwick Rams, Shearling and upwards.* [3 entries.]

1729 **I.** (£10.)—JOHN T. MACKERETH, Brantholme, Ambleside, for **King Moor 2nd**, born April, 1901.

1730 **II.** (£5.)—WILLIAM MACKERETH, Green Bank, Ambleside, for **Hero**, born April, 1897, bred by J. Bennett, Darling How, Cumberland.

1731 **III.** (£3.)—JOHN NEWBY, Aulthurstside, Broughton-in-Furness, born March 20, 1902, bred by C. Dove, Field Head, Hawkshead, Lancs.

Class 218.—*Pens of Three Herdwick Shearling Ewes, of the same Flock.* [3 entries.]

1732 **I.** (£10.)—JOHN T. MACKERETH, Brantholme, Ambleside.

1734 **II.** (£5.)—JOHN NEWBY, Aulthurstside, Broughton-in-Furness, bred by W. Mackereth, Green Bank, Ambleside.

1733 **III.** (£3.)—WILLIAM MACKERETH, Green Bank, Ambleside.

Welsh Mountain.

Class 219.—*Welsh Mountain Rams, Shearling and upwards.* [6 entries, none absent.]

1736 **I.** (£10.)—W. CONWY BELL, Bryn-y-ffynon, Rhuddlan, R.S.O., for **Dewis Dafydd**, born 1903; s. Cymro Pŵr.

1737 **II.** (£5.)—W. CONWY BELL, for **Twm Shon Dafydd 2nd**, born 1901, bred by W. E. Williams, Gwerclas, Corwen; s. Twm Shon Dafydd, d. Fechan by Prince Dafydd.

1738 **III.** (£3.)—J. LL. GRATTON, Voryd Farm, Abergele, for **Llewellyn**, born 1900, bred by W. E. Williams, Gwerclas, Corwen.

1735 **R. N. & H. C.**—W. CONWY BELL, for **Cymro Ieuanc**.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 220.—*Pens of Three Welsh Mountain Shearling Ewes, of the same Flock.* [5 entries, 1 absent.]

- 1743 I. (£10.)—J. LL. GRATTON, Voryd Farm, Abergale; s. Bryn Melyn Chief.
 1741 II. (£5.)—W. CONWY BELL, Bryn-y-ffynon, Rhuddlan, R.S.O.
 1742 III. (£3.)—W. CONWY BELL, bred by W. E. Williams, Gwerclas, Corwen.
 1744 R. N. & H. C.—WILLIAM LEATHES, Wern Fawr, Ruthin.

Ryeland.

Class 221.—*Ryeland Rams, Two-Shear and upwards.*¹ [3 entries.]

- 1748 I. (£10.)—F. E. GOUGH, Bodenham, Leominster, born March 2, 1901.
 1746 II. (£5.)—W. T. BARNEBY, Saltmarshe Castle, Bromyard, for **Cube Root**, born March, 1902; s. Longsides, d. by Slowcoach.
 1747 III. (£3.)—W. H. DAVIES, Claston and Livers Ocle, Hereford, for **Leominster**, born March, 1901, bred by F. E. Gough, Bodenham, Leominster.

Class 222.—*Ryeland Shearling Rams.* [5 entries, 1 absent.]

- 1749 I. (£10.)—W. T. BARNEBY, Saltmarshe Castle, Bromyard.
 1752 II. (£5.)—W. H. DAVIES, Claston and Livers Ocle, Hereford, for **Weston Champion**; s. Shucknall 1st.
 1751 III. (£3.)—W. H. DAVIES, for **Longsides**; s. Leominster.
 1753 R. N. & H. C.—F. E. GOUGH, Bodenham, Leominster.

Class 223.—*Pens of Three Ryeland Shearling Ewes, of the same Flock.* [4 entries.]

- 1755 I. (£10.) & 1754 II. (£5.)—W. T. BARNEBY, Saltmarshe Castle, Bromyard.
 1757 III. (£3.)—F. E. GOUGH, Bodenham, Leominster; s. Evesham.
 1756 R. N. & H. C.—W. H. DAVIES, Claston and Livers Ocle, Hereford.

PIGS.

Large White Breed.

Class 224.—*Large White Boars, farrowed in 1902 or 1903.*

[7 entries, none absent.]

- 1760 I. (£10. & **Champion**.²)—THE EARL OF ELLESMERE, Worsley Hall, Manchester, for **Roger** 7203, born Feb. 4, 1902, bred by the late Philip Ascroft, Rufford, Ormskirk; s. Borrowfield Ringleader 5th 5871, d. Sunbeam 15th 10582 by Rufford Prince 5187.
 1762 II. (£5.)—R. M. KNOWLES, Colston Bassett Hall, Bingham, for **Vanguard** 7261, born Jan. 4, 1902, bred by Philo L. Mills, Ruddington Hall, Nottingham; s. St. Paul 5611, d. Miss Hollingworth 39th 10390 by Ruddington King David 8th 4031.
 1764 III. (£3.)—RICHARD STUART, Brook Vale, Sowerby, Garstang, for **Sowerby Emperor** 7245, born April 4, 1902; s. Borrowfield Clipper 6261, d. Sowerby Empress 12990 by Long Sam 339.
 1759 R. N. & H. C.—T. DODD & SONS, Mollington Grange, Chester, for **Mollington Sam** 2nd.

Class 225.—*Pens of Three Large White Boar Pigs, farrowed in 1904.*

[16 entries, 2 absent.]

- 1766 I. (£10.)—D. R. DAYBELL, Bottesford, Nottingham, born Jan. 6; s. Wissett Young Ruddington Champion 8077, d. Bottesford Queen 13th 10152 by Bottesford Rufford.
 1774 II. (£5.)—JOHN NEAVERSON, Eye, Peterborough, born Jan. 2; s. Eye Conqueror 6377, d. Eye Princess 1st 13994 by Eye Sam 7031.
 1768 III. (£3.)—THE EARL OF ELLESMERE, Worsley Hall, Manchester, born Jan. 3 and 5; s. Duke of York 4th 5935, ds. Worsley Hawthorn 5th 14896 by Worsley Royal 2nd 5681, Worsley Lass 14906 by Peterborough Turk 6525, and Wrexham Hawthorn 9008 by Wrexham Pete 4843.
 1770 R. N. & H. C.—THOMAS HENSON, Eastgate, Peterborough.

Class 226.—*Large White Breeding Sows, farrowed in 1900, 1901, 1902, or 1903.* [10 entries, none absent.]

- 1785 I. (£10. & R. N. for **Champion**.²)—THE EARL OF ELLESMERE, Worsley Hall, Manchester, for **Worsley Parquet** 11794, born Feb. 28, 1901 [farrowed Aug. 8, 1904], bred by John Parr, Wiston Grange, Leicester; s. Borrowfield Eclipse 5427, d. Parquet 10510 by Bottesford Lad 2nd 3895.

¹ Prizes given by the Ryeland Flock Book Society.

² Champion Gold Medal, value £5 5s., given by the National Pig Breeders' Association for the best Large White Boar or Sow in Classes 224 and 225.

ccxxii Award of Live Stock Prizes at Park Royal, 1904.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 1788 II. (£5.¹)—T. SIMPSON JAY, Warren Farm, Wimbledon, for **Warren Susan** 14784, born March 10, 1903 [farrowed Aug. 8, 1904]; s. Holywell Emperor 2nd 6401, d. Holywell Smithfield Slit Ear 11430 by Holywell Elephant 5103.
1789 III. (£3.¹)—R. M. KNOWLES, Colston Bassett Hall, Bingham, for **Colston Lass** 11216, born Jan. 7, 1900 [farrowed April 29, 1904], bred by Albert Armitage, Cotgrave Place, Nottingham; s. Ruddington King David 5th 3143, d. Cotgrave Weston Lass 6512 by Borrowfield Rufford 1711.

Class 227.—*Pens of Three Large White Sow Pigs, farrowed in 1904.*
[15 entries, 1 absent.]

- 1790 I. (£10.)—R. M. KNOWLES, Colston Bassett Hall, Bingham, born Jan. 5; s. Vanguard 7261, d. Colston Lass 11216 by Ruddington King David 5th 3143.
1791 II. (£5.)—D. R. DAYBELL, Bottesford, Nottingham, born Jan. 6; s. Wissett Young Ruddington Champion 8077, d. Bottesford Queen 13th 10152 by Bottesford Rufford.
1797 III. (£3.)—THOMAS HENSON, Eastgate, Peterborough, born Jan. 7; s. Shitterton Turk 7937, d. Peterboro' Queen 4th 11582 by Peterboro' King 6019.
1805 R. N. & H. C.—RICHARD STUART, Brook Vale, Sowerby, Garstang.

Middle White Breed.

Class 228.—*Middle White Boars, farrowed in 1902 or 1903.*
[4 entries.]

- 1809 I. (£10. & R. N. for Champion.¹)—SANDERS SPENCER, Holywell Manor, St. Ives, for **Holywell Middleton** 8169, born Jan. 5, 1902; s. Holywell Shorthhead 6725, d. Holywell Middlesboro' 2nd by Holywell John Bull 4867.
1808 II. (£5.)—T. SIMPSON JAY, Warren Farm, Wimbledon, for **Warren Middleman** 8233, born Jan. 20, 1903; s. Holywell Middleton 8169, d. Holywell Midget 6th 13284 by Holywell Rosador 2nd 6139.
1806 III. (£3.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Hardwick Albert** 7357, born April 20, 1902, bred by the Duchess of Newcastle, Clumber, Worksop; s. Offley Baron 7391, d. Hardwick Princess 13272 by Holywell King George 7373.
1807 R. N. & H. C.—SIR GILBERT GREENALL, BT., for **Offley John**.

Class 229.—*Pens of Three Middle White Boar Pigs, farrowed in 1904.*
[7 entries, none absent.]

- 1813 I. (£10.)—T. SIMPSON JAY, Warren Farm, Wimbledon, born Jan. 12; s. Sberborne Baron 7409, d. Holywell Rosy Dawn E3292 by Holywell Shorthhead 6725.
1811 II. (£5.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, born Jan. 10 and Feb. 2; ss. Hardwick Albert 7357 and Walton Turret 8217, ds. Walton Pattie 3rd 15132 by Rufford Mayor 5309, and Walton Rose 20th 15138 by Walton John 6755.
1815 III. (£3.)—SANDERS SPENCER, Holywell Manor, St. Ives, born Jan. 22; s. Castlecroft Dictator 6111, d. Holywell Curly Rose 2nd by Holywell Count Curly 5713.
1816 R. N. & H. C.—SANDERS SPENCER, born Jan. 1 and 2.

Class 230.—*Middle White Breeding Sows, farrowed in 1900, 1901, 1902, or 1903.* [7 entries, none absent.]

- 1821 I. (£10. & Champion.²)—SANDERS SPENCER, Holywell Manor, St. Ives, for **Holywell Carlisle Victoria**, born Jan. 15, 1902, [farrowed Aug. 28, 1904]; s. Holywell Count Curly 5713, d. Holywell Victoria Countess 13298 by Holywell Count 3239.
1818 II. (£5.³)—SIR GILBERT GREENALL, BT., for **Walton Rose** 14th 12002, born Jan. 4, 1901, [farrowed May 9, 1904]; s. Walton Andrew 6167, d. Walton Rose 8th 9130 by Walton Editor 4499.
1820 III. (£3.³)—SANDERS SPENCER, for **Holywell Barbara**, born Jan. 1, 1903, [farrowed April 3, 1904]; s. Holywell Middleton 8169, d. Holywell Curly Rose 2nd by Holywell Count Curly 5713.

Class 231.—*Pens of Three Middle White Sow Pigs, farrowed in 1904.*
[8 entries, 1 absent.]

- 1830 I. (£10.)—SANDERS SPENCER, Holywell Manor, St. Ives, born Jan. 1 and 2; ss. Holywell Viscount 8179 and Holywell Middleton 8169, ds. Holywell Rosadora Countess 13286 by Holywell Count Curly 5713, and Holywell Carlisle Victoria by Holywell Count Curly 5713.

¹ Nos. 1788 and 1789 have succeeded to their present positions by the disqualification through non-compliance with the Regulation as to farrowing before Sept. 1, 1904, of No. 1784 (Second Prize in Class 226).

² Champion Gold Medal, value £5 ss., given by the National Pig Breeders' Association for the best Middle White Boar or Sow in Classes 228 and 230.

³ Nos. 1818 and 1820 have succeeded to their present positions by the disqualification through non-compliance with the Regulation as to farrowing before Sept. 1, 1904, of No. 1817 (Second Prize in Class 230).

Middle White, Berkshire, and Tamworth Pigs. cxxxiii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 1824 II. (£5.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, born Jan. 6; s. Walton Turret 8217, d. Walton Rose 22nd 15142 *by* Walton Dainty 6753.
 1828 III. (£3.)—T. SIMPSON JAY, Warren Farm, Wimbledon, born Jan. 12; s. Sherborne Baron 7409, d. Holywell Rosy Dawn 13292 *by* Holywell Shorthed 6725.
 1829 R. N. & H. C.—THE DUCHESS OF NEWCASTLE, Clumber, Worksop.

Berkshire Breed.

Class 232.—*Berkshire Boars, farrowed in 1902 or 1903.*

[20 entries, 2 absent.]

- 1841 I. (£10, & R. N. for Champion.¹)—SIR ALEXANDER HENDERSON, BART., M.P., Buscot Park, Faringdon, for **Lyneham Lad** 9506, born Feb. 23, 1902, bred by J. Lawrence, Stall Pitts Farm, Shrivenham; s. Lyneham 8355, d. Lip Salve 6725 *by* Loyal Berks 6391.
 1834 II. (£5.)—NATHANIEL BENJAFIELD, Shorts Green Farm, Motcombe, Shaftesbury, for **Commander-in-Chief**, born Dec. 5, 1902; s. Baron Kitchener 8403, d. Sarah Compton 9147 *by* Faithful Compton 9144.
 1846 III. (£3.)—J. JEFFERSON, Peel Hall, Chester, for **Peel Champion**, born Jan. 10, 1903; s. Peel Swansea 2nd 8748, d. Peel Rosebud 2nd 7506 *by* Peel Surprise 5884.
 1838 R. N. & H. C.—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Polegate Doctor**.

Class 233.—*Pens of Three Berkshire Boar Pigs, farrowed in 1904.*

[14 entries, 7 absent.]

- 1857 I. (£10.)—J. A. FRICKER, Burton, Mere, Wilts, born Jan. 4; s. Hightide 9373, d. Gillingham N. 9078 *by* Faithful Commons 6640.
 1861 II. (£5.)—THE HON. A. HOLLAND-HIBBERT, Munden, Watford, born Jan. 12; s. Munden Baronet 9472, d. Burbidge 18th 9473 *by* Munden Model 7574.
 1860 III. (£3.)—ARTHUR HISCOCK, JUN., Manor Farm, Motcombe, Shaftesbury, born Jan. 2; s. Hall Mark G. 7900, d. Manor Sweetheart 9236 *by* College Boy 8055.
 1852 R. N. & H. C.—NATHANIEL BENJAFIELD, Shorts Green Farm, Motcombe.

Class 234.—*Berkshire Breeding Sows, farrowed in 1900, 1901, 1902, or 1903.*

[28 entries, 8 absent.]

- 1889 I. (£10, & Champion.¹)—THE HON. CLAUD B. PORTMAN, Child-Okeford Manor, Blandford, for **Manor Empress Queen** 8660, born Jan. 6, 1902 [farrowed July 17, 1904], bred by A. Hiscock, Jun., Manor Farm, Motcombe, Shaftesbury; s. First Rank F. 7422, d. Manor First Choice 12th H. 7710, *by* Hampshire 5563.
 1884 II. (£5.)—J. JEFFERSON, Peel Hall, Chester, for **Peel Elsie** 9797, born Sept. 2, 1902 [farrowed Aug. 12, 1904], bred by N. Benjafield, Shorts Green Farm, Motcombe, Shaftesbury; s. Carnarvon 8325, d. Split Ear 9799 *by* Sambo H. 8320.
 1873 III. (£3.²)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Polegate Decoy** 9153, born Jan. 3, 1902 [farrowed between Aug. 13 and 20, 1904], bred by R. B. Vincent, Compton Vallance, Dorchester; s. Baron Kitchener 8403, d. Compton Princess 8402 *by* Gold Medallist 6061.

Class 235.—*Pens of Three Berkshire Sow Pigs, farrowed in 1904.*

[11 entries, 2 absent.]

- 1899 I. (£10.)—J. A. FRICKER, Burton, Mere, Wilts, born Jan. 2; s. Hightide 9373, d. Bright's Keepsake 8380 *by* First Catch F. 5925.
 1894 II. (£5.)—NATHANIEL BENJAFIELD, Shorts Green Farm, Motcombe, Shaftesbury, born Jan. 2; s. Marlborough 8940, d. Dilton Horner *by* First Rank F. 7422.
 1902 III. (£3.)—THE HON. A. HOLLAND-HIBBERT, Munden, Watford, born Jan. 10 and 12; s. Munden Model 7574 and Munden Baronet 9472, *ds.* Burbidge 12th 7779 *by* Munden Pride 7243 and Burbidge 18th 9473 *by* Munden Model 7574.
 1901 R. N. & H. C.—ARTHUR HISCOCK, JUN., Manor Farm, Motcombe, Shaftesbury.

Tamworth Breed.

Class 236.—*Tamworth Boars, farrowed in 1902 or 1903.*

[5 entries, none absent.]

- 1907 I. (£10, & R. N. for Champion.³)—ROBERT IBBOTSON, The Hawthorns, Knowle, for **Warwickshire Duke** 8387, born July 1, 1902; s. Knowle Welshman 2nd 6815, d. Knowle Redman 2nd 9950 *by* Knowle Masher 5375.

¹ Champion Prize of £5 given by the British Berkshire Society for the best Berkshire Boar or Sow in Classes 232 and 234.

² No. 1873 has succeeded to its present position by the disqualification through non-compliance with the Regulation as to farrowing before Sept. 1, 1904, of No. 1866 (Third Prize in Class 234).

³ Champion Gold Medal, value £5 5s. given by the National Pig Breeders' Association for the best Tamworth Boar or Sow in Classes 236 and 238.

cxxxiv *Award of Live Stock Prizes at Park Royal, 1904.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 1906 **II. (£5.)**—ROBERT IBBOTSON, for **Knowle King Edward** 8215, born April 3, 1903; s. Knowle Rex 7481, d. Knowle Redmane 5th 12102 by Knowle Welshman 2nd 6815.
 1908 **III. (£3.)**—D. W. PHILIP, The Ashes, Whitacre, Birmingham, for **Whitacre Roamer** 8399, born July 18, 1903; s. Whitacre Bounder 7511, d. Whitacre Matchless 10050 by Whitacre Lawyer 4985.
 1905 **R. N. & H. C.**—EGBERT DE HAMEL, Middleton Hall, Tamworth, for **Middleton Manchuria**.

Class 237.—*Pens of Three Tamworth Boar Pigs, farrowed in 1904.*

[6 entries, none absent.]

- 1915 **I. (£10.)**—H. C. STEPHENS, Cholderton, Salisbury, born Jan. 4; s. Whitacre Bounder 7511, d. Cholderton Ruby 13408 by Knowle Forester 5369.
 1914 **II. (£5.)**—D. W. PHILIP, The Ashes, Whitacre, Birmingham, born Jan. 2; s. Whitacre Unionist 6873, d. Whitacre Matchless 10050 by Whitacre Lawyer 4985.
 1913 **III. (£3.)**—ROBERT IBBOTSON, The Hawthorns, Knowle, born Jan. 2, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Coventry; s. Knowle Comus 8305, d. Gun Hill Esther 13458 by Knowle Welshman 2nd 6815.
 1912 **R. N. & H. C.**—ROBERT IBBOTSON.

Class 238.—*Tamworth Breeding Sows, farrowed in 1900, 1901, 1902, or 1903.*

[9 entries, 1 absent.]

- 1922 **I. (£10, & Champion.¹)**—H. C. STEPHENS, Cholderton, Salisbury, for **Cholderton Fancy** 15202, born Dec. 5, 1902 [farrowed June 23, 1904]; s. Knowle Forester 5369, d. Cholderton Favourite 5th 12062 by Knowle King 3rd 4945.
 1923 **II. (£5.)**—H. C. STEPHENS, for **Cholderton Favourite** 5th 12062, born Jan. 24, 1901 [farrowed June 22, 1904]; s. Knowle King 3rd 4945, d. Whitacre Favourite 7330 by Knowle Rector 3783.
 1921 **III. (£3.)**—D. W. PHILIP, The Ashes, Whitacre, Birmingham, for **Whitacre Corelli** 15418, born Jan. 3, 1903 [farrowed July 16, 1904]; s. Whitacre Bounder 7511, d. Whitacre Matchless 10050 by Whitacre Lawyer 4985.
 1917 **R. N. & H. C.**—ROBERT IBBOTSON, The Hawthorns, Knowle, for **Knowle Redmane** 4th.

Class 239.—*Pens of Three Tamworth Sow Pigs, farrowed in 1904.*

[7 entries, none absent.]

- 1931 **I. (£10.)**—H. C. STEPHENS, Cholderton, Salisbury, born Jan. 7; s. Whitacre Bounder 7511, d. Cholderton Favourite 11th 13400 by Knowle Forester 5369.
 1928 **II. (£5.)**—ROBERT IBBOTSON, The Hawthorns, Knowle, born Jan. 2, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Coventry; s. Knowle Comus 8305, d. Gun Hill Coronation 13456 by Knowle Welshman 2nd 6815.
 1929 **III. (£3.)**—ROBERT IBBOTSON, born Jan. 2, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Coventry; s. Knowle Comus 8305, d. Gun Hill Esther 13458 by Knowle Welshman 2nd 6815.
 1930 **R. N. & H. C.**—D. W. PHILIP, The Ashes, Whitacre, Birmingham.

Large Black Breed.

Class 240.—*Large Black Boars, farrowed in 1902 or 1903.*

[10 entries, 2 absent.]

- 1939 **I. (£10, & Champion.²)**—JOHN ROBINSON, Rings Hill, Borstal, Rochester, for **Borstal Masterpiece** 841, born Sept. 21, 1902; s. Iford Masterpiece 359, d. Iford Slave 1692 by Westleigh William the Conqueror 163.
 1938 **II. (£5, & R. N. for Champion.²)**—C. F. MARRINER, Hasketon, Woodbridge, for **Hasketon Coronation** 611, born Jan. 25, 1902; s. Cornish Beau 239, d. Trethorne Duchess 572 by Big Ben 1st 27.
 1940 **III. (£3.)**—JOHN WARNE, Treveglos, St. Mabyn, R.S.O., for **Treveglos Marquis** 1049, born June 2, 1903; s. Trevesquite Conqueror 679, d. Treveglos Model 2048 by Tinten Happy Boy 139.
 1932 **R. N. & H. C.**—KENNETH M. CLARK, Sudbourn Hall, Orford, for **Sudbourn Shot**.

Class 241.—*Large Black Boar Pigs, farrowed in 1904.*

[14 entries, none absent.]

- 1947 **I. (£10.)**—JOHN R. T. KINGWELL, Great Aish, South Brent, for **Brent Jumbo** 3rd, born Jan. 3; s. Jumbo 2nd 505, d. Sally 2014.

¹ Champion Gold Medal, value £5 5s., given by the National Pig Breeders' Association for the best Tamworth Boar or Sow in Classes 236 and 238.

² Champion Prize of £10 given by the Large Black Pig Society for the best Large Black Boar in Classes 240 and 241.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 1954 II. (£5.)—THOMAS WARNE, Trevisquite Manor, St. Mabyn R.S.O., born Jan. 12; s. Trevisquite Conqueror 679, d. Trevisquite Careful 1828.
 1942 III. (£3.) & 1943 R. N. & H. C.—KENNETH M. CLARK, Sudbourn Hall, Orford, born Jan. 13, bred by A. H. E. Wood, Sudbourn Hall, Orford; s. Iford Baron 587, d. Sudbourn Sall A. 3346 by Sudbourn Sam 243.

Class 242.—Large Black Breeding Sows, farrowed in 1900, 1901, 1902, or 1903. [16 entries, 1 absent.]

- 1959 I. (£10.¹)—EPHRAIM GIMBLETT, Church Town, Davidstow, Camelford, for Davidstow Model 1784, born June 28, 1901 [farrowed July 6, 1904]; s. General Buller 327, d. Susy 1st 1252 by Tideford Longsides 135.
 1960 II. (£5.¹)—W. H. GIMBLETT, Dutson Farm, St. Stephen's, Launceston, for Davidstow Wonder 1786, born June 28, 1901 [farrowed July 24, 1904], bred by Ephraim Gimblett, Davidstow, Camelford; s. General Buller 327, d. Susy 1st 1252 by Tideford Longsides.
 1966 III. (£3.¹)—H. G. REGNART, Frith Manor, Mill Hill, N.W., for Frith Manor Lady 3032, born January 18, 1903 [farrowed July 4, 1904]; s. Royal Bodmin 455, d. Hasketon Polly 1800 by Akenham Link 9.

Class 243.—Pens of Three Large Black Sow Pigs, farrowed in 1904.
 [13 entries, none absent.]

- 1982 I. (£10.)—JOHN WARNE, Treveglos, St. Mabyn, R.S.O., born Jan. 27; s. Trevisquite Conqueror 679, d. Treveglos Model 2048 by Tinten Happy Boy 139.
 1975 II. (£5.)—EPHRAIM GIMBLETT, Church Town, Davidstow, Camelford, born Jan. 2; s. Treveglos Black Prince, d. Susy 2nd 1254 by Halwill Jumbo 77.
 1974 III. (£3.)—J. B. DIMMOCK, Shotford Hall, Harleston, born Jan. 7; s. Hasketon Beau 2nd 775, d. Shotford Bonny 3rd 1654 by Cornishman 53.
 1983 R. N. & H. C.—THOMAS WARNE, Trevisquite Manor, St. Mabyn, R.S.O.

POULTRY.

By "Cock," "Hen," "Drake," "Duck," "Gander" and "Goose," are meant birds hatched previous to January 1st, 1904; and by "Cockerel," "Pullet," "Young Drake," and "Duckling," are meant birds hatched in 1904, previous to June 1.

FOWLS.

Game.

Class 244.—Old English Game Cocks. [6 entries, none absent.]

- 1989 I. (20s.)—ISAAC W. MESSENGER, Mill Hill Mill, Hensingham, Whitehaven.
 1985 II. (10s.)—COLLINS & NEWALL, Newsham, Blyth, Northumberland.
 1986 III. (5s.)—VISCOUNT DEERHURST, Dynes Hall, Halstead, Essex.
 1987 R. N. & H. C.—JOHN JOHNSTON, Grain Cottage, Kirklington, Carlisle.

Class 245.—Old English Game Hens. [4 entries, 1 absent.]

- 1992 I. (20s.)—ROBERT HOLLIDAY, Laversdale Lane, Low Crosby, Carlisle.
 1991 II. (10s.)—COLLINS & NEWALL, Newsham, Blyth, Northumberland.
 1994 III. (5s.)—ISAAC W. MESSENGER, Mill Hill Mill, Hensingham, Whitehaven.

Class 246.—Old English Game Cockerels. [7 entries, none absent.]

- 1995 I. (20s.)—PHILIP A. FISHER, Carhead, Crossbills, Keighley.
 2000 II. (10s.)—D. & C. PEARY, 14 First Row, Ashington, Morpeth.
 1999 III. (5s.) & 1998 R. N. & H. C.—LAMBERT BROS., East View, Silsden, Keighley.

Class 247.—Old English Game Pullets. [7 entries, none absent.]

- 2005 I. (20s.)—LAMBERT BROS., East View, Silsden, Keighley.
 2002 II. (10s.)—COLLINS & NEWALL, Newsham, Blyth, Northumberland.
 2003 III. (5s.)—DAVID S. CRYER, Town Head Farm, Silsden, Keighley.
 2004 R. N. & H. C.—PHILIP A. FISHER, Carhead, Crossbills, Keighley.

Class 248.—Indian Game Cocks. [5 entries, none absent.]

- 2013 I. (20s.)—FIRTH BROS., Wharton Farm, Acton Vale, W.
 2010 II. (10s.)—W. H. CRANE, Great Barr Hall, Birmingham.
 2011 III. (5s.)—LORD DE RAMSEY, Haverland Hall, Norwich.
 2009 R. N. & H. C.—H. ANNINGSOON, Manor House, Humberstone, Grimsby.

¹ Nos. 1959, 1960 and 1966 have succeeded to their present positions by the disqualification through non-compliance with the Regulation as to farrowing before Sept. 1, 1904, of No. 1970 (First Prize in Class 242).

Class 249.—*Indian Game Hens.* [5 entries, none absent.]

- 2018 I. (20s.)—FIRTH BROS., Wharton Farm, Acton Vale, W.
 2017 II. (10s.)—GEORGE FAULKNER, Rowton, Chester.
 2015 III. (5s.)—W. H. CRANE, Great Barr Hall, Birmingham.
 2016 R. N. & H. C.—LORD DE RAMSEY, Haverland Hall, Norwich.

Class 250.—*Indian Game Cockerels.* [3 entries.]

- 2021 I. (20s.)—HERBERT JACKSON, 15 Mark Street, Cardiff.
 2020 II. (10s.)—FIRTH BROS., Wharton Farm, Acton Vale, W.
 2019 III. (5s.)—GEORGE FAULKNER, Rowton, Chester.

Class 251.—*Indian Game Pullets.* [4 entries.]

- 2024 I. (20s.)—FIRTH BROS., Wharton Farm, Acton Vale, W.
 2025 II. (10s.)—WILLIAM HAMBLBY, Cutlinwith, St. Germans.
 2022 III. (5s.), & 2023 R. N. & H. C.—GEORGE FAULKNER, Rowton, Chester.

Dorkings.

Class 252.—*Coloured Dorking Cocks.* [6 entries, 1 absent.]

- 2026 I. (20s.)—VISCOUNT DEERHURST, Dynes Hall, Halstead.
 2029 II. (10s.)—A. T. & H. PEARS, Mere, Lincoln.
 2030 III. (5s.)—HERBERT REEVES, Emsworth, Hants.
 2028 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

Class 253.—*Coloured Dorking Hens.* [5 entries, 2 absent.]

- 2034 I. (20s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks.
 2036 II. (10s.)—HERBERT REEVES, Emsworth, Hants.
 2032 III. (5s.)—VISCOUNT DEERHURST, Dynes Hall, Halstead.

Class 254.—*Coloured Dorking Cockerels.* [10 entries, 2 absent.]

- 2037 I. (20s.)—CHARLES AITKENHEAD, Stud Farm, Seaham Harbour.
 2038 II. (10s.)—THOMAS BRIDEN, Cononley, *via* Keighley.
 2046 III. (5s.)—HERBERT REEVES, Emsworth, Hants.
 2039 R. N. & H. C.—A. K. CRICHTON, Estates Office, Bridge-of-Weir.

Class 255.—*Coloured Dorking Pullets.* [9 entries, 1 absent.]

- 2054 I. (20s.), & 2053 III. (5s.)—HERBERT REEVES, Emsworth, Hants.
 2047 II. (10s.)—THOMAS BRIDEN, Cononley, *via* Keighley.
 2052 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

Class 256.—*Silver Grey Dorking Cocks.* [10 entries, 1 absent.]

- 2062 I. (20s.), & 2061 II. (10s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks.
 2057 III. (5s.)—VISCOUNT DEERHURST, Dynes Hall, Halstead.
 2064 R. N. & H. C.—C. SNEDDON, Kirkham, Lancs.

Class 257.—*Silver Grey Dorking Hens.* [8 entries, none absent.]

- 2072 I. (20s.)—C. SNEDDON, Kirkham, Lancs.
 2066 II. (10s.)—THE HON. FLORENCE AMHERST, Didlington Hall, Brandon.
 2071 III. (5s.)—HERBERT REEVES, Emsworth, Hants.
 2069 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

Class 258.—*Silver Grey Dorking Cockerels.* [4 entries, none absent.]

- 2077 I. (20s.), & 2076 III. (5s.)—HERBERT REEVES, Emsworth, Hants.
 2074 II. (10s.)—THE HON. FLORENCE AMHERST, Didlington Hall, Brandon.

Class 259.—*Silver Grey Dorking Pullets.* [8 entries, 1 absent.]

- 2078 I. (20s.)—THE HON. FLORENCE AMHERST, Didlington Hall, Brandon.
 2083 II. (10s.), & 2084 III. (5s.)—HERBERT REEVES, Emsworth, Hants.
 2081 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

Class 260.—*Dorking Cocks or Cockerels, white or any other variety.*
 [4 entries.]

- 2087 I. (20s.)—DR. H. C. TITTERTON, Vine Cottage, Norwood Green, Southall.
 2088 II. (10s.), & 2089 III. (5s.)—J. J. G. WOODCOCK, Briston, Melton Constable. (White.)
 2086 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley, Bucks. (Rose-combed.)

Class 261.—*Dorking Hens or Pullets, white or any other variety.*
 [5 entries, 1 absent.]

- 2094 I. (20s.)—J. J. G. WOODCOCK, Briston, Melton Constable. (White.)
 2092 II. (10s.)—DR. H. C. TITTERTON, Vine Cottage, Norwood Green, Southall.
 2090 III. (5s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks. (Rose-combed.)
 2091 R. N. & H. C.—ARTHUR C. MAJOR. (Cuckoo.)

Sussex.¹

Class 262.—*Red or Brown Sussex Cocks.* [5 entries, none absent.]

- 2095 I. (20s., & Medal.²)—DAVID ROBERTS, Hill Brow, The Wallands, Lewes. (Red.)
2096 II. (10s.)—E. & H. RUSSELL, Broomham, Chiddingly, Sussex. (Red.)
2098 III. (5s.), & 2099 R. N. & H. C.—E. J. WADMAN, Hurst Barns, East Chilton, Lewes. (Red.)

Class 263.—*Red or Brown Sussex Hens.* [7 entries, 4 absent.]

- 2106 I. (20s., & R. N. for Medal²), 2104 II. (10s.), & 2105 III. (5s.)—E. J. WADMAN, Hurst Barns, East Chilton, Lewes. (Red.)

Class 264.—*Red or Brown Sussex Cockerels.* [5 entries, none absent.]

- 2108 I. (20s.)—E. & H. RUSSELL, Broomham, Chiddingly, Sussex. (Red.)
2107 II. (10s.)—EAST SUSSEX EDUCATION COMMITTEE, Agricultural College, Uckfield. (Red.)
2110 III. (5s.), & 2109 R. N. & H. C.—E. J. WADMAN, Hurst Barns, East Chilton, Lewes. (Red.)

Class 265.—*Red or Brown Sussex Pullets.* [5 entries, none absent.]

- 2113 I. (20s.)—E. & H. RUSSELL, Broomham, Chiddingly, Sussex.
2116 II. (10s.), 2115 III. (5s.), & 2114 R. N. & H. C.—E. J. WADMAN, Hurst Barns, East Chilton, Lewes. (Red.)

Class 266.—*Light Sussex Cocks.* [3 entries.]

- 2118 I. (20s.)—DAVID ROBERTS, Hill Brow, The Wallands, Lewes.
2117 II. (10s.)—EAST SUSSEX EDUCATION COMMITTEE, Agricultural College, Uckfield.
2119 III. (5s.)—E. & H. RUSSELL, Broomham, Chiddingly, Sussex.

Class 267.—*Light Sussex Hens.* [5 entries, none absent.]

- 2124 I. (20s., & Medal.²)—E. & H. RUSSELL, Broomham, Chiddingly, Sussex.
2123 II. (10s.), & 2122 III. (5s.)—DAVID ROBERTS, Hill Brow, The Wallands, Lewes.
2120 R. N. & H. C.—EAST SUSSEX EDUCATION COMMITTEE, Agricultural College, Uckfield.

Class 268.—*Light Sussex Cockerels.* [5 entries, none absent.]

- 2125 I. (20s.), 2126 II. (10s.), & 2127 III. (5s.)—EAST SUSSEX EDUCATION COMMITTEE, Agricultural College, Uckfield.
2129 R. N. & H. C.—E. & H. RUSSELL, Broomham, Chiddingly, Sussex.

Class 269.—*Light Sussex Pullets.* [6 entries, none absent.]

- 2132 I. (20s., & R. N. for Medal²), & 2131 II. (10s.)—EAST SUSSEX EDUCATION COMMITTEE, Agricultural College, Uckfield.
2133 III. (5s.)—DAVID ROBERTS, Hill Brow, The Wallands, Lewes.
2135 R. N. & H. C.—E. & H. RUSSELL, Broomham, Chiddingly, Sussex.

Class 270.—*Speckled Sussex Cocks.* [No entries.]

Class 271.—*Speckled Sussex Hens.* [7 entries, none absent.]

- 2139 I. (20s., & Medal.²)—CHARLIE PAGE, Crossways House, Polegate.
2140 II. (10s.)—F. J. PAGE, Wilmington, Berwick Station, Sussex.
2138 III. (5s.)—G. J. LENNY, The Retreat, Buxted.
2142 R. N. & H. C.—E. & H. RUSSELL, Broomham, Chiddingly, Sussex.

Classes 272 and 273.—*Speckled Sussex Cockerels and Pullets.*

[No entries.]

Brahmas and Cochins.

Class 274.—*Brahma Cocks.* [No entries.]

Class 275.—*Brahma Hens.* [4 entries, 1 absent.]

- 2145 I. (20s.)—MRS. SPERLING, Lew Trenchard, Lew Down.
2143 II. (10s.)—J. B. GILBERT, The Red House, Winchester.
2146 III. (5s.)—R. W. WEBSTER, Hillside, Maidenhead.

¹ The Sussex Poultry Club subscribed £7 towards these Prizes.

² Three Silver Medals given by the Sussex Poultry Club for the best Bird of the Red or Brown, Light and Speckled Varieties, in Classes 262-273.

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Class 276.—*Cochin Cocks.* [6 entries, none absent.]

- 2150 I. (20s.). & 2151 II. (10s.).—R. H. LINGWOOD, Riverside Poultry Yard, Needham.
2149 III. (5s.).—J. B. GILBERT, The Red House, Winchester.
2147 R. N. & H. C.—THOMAS GASCOIGNE, Brahma Cottage, North Muskham, Newark.

Class 277.—*Cochin Hens.* [5 entries, none absent.]

- 2157 I. (20s.), 2155 II. (10s.), & 2156 R. N. & H. C.—J. B. GILBERT, The Red House, Winchester.
2153 III. (5s.).—A. K. CRICHTON, Estates Office, Bridge-of-Weir, N.B.

Class 278.—*Brahma or Cochin Cockerels.* [No entries.]

Class 279.—*Brahma or Cochin Pullets.* [4 entries.]

- 2159 I. (20s.).—DR. F. RUTHERFOORD HARRIS, M.P., Llangibby Castle, Newport, Mon. (Cochin).
2161 II. (10s.), & 2160 III. (5s.).—R. H. LINGWOOD, Riverside Poultry Yard, Needham, Suffolk. (Cochin).
2158 R. N. & H. C.—THOMAS GASCOIGNE, Brahma Cottage, North Muskham, Newark.

Langshans.

Class 280.—*Langshan Cocks or Cockerels.* [4 entries.]

- 2162 I. (20s.), & 2163 III. (5s.).—W. H. CRANE, Great Barr Hall, Birmingham.
2165 II. (10s.).—HARRY WALLIS, Northend, Warley, Brentwood.
2164 R. N. & H. C.—ALFRED LE CORNU, Union Inn, Mont à l'Abbé, St. Helier's, Jersey.

Class 281.—*Langshan Hens or Pullets.* [No entries.]

Plymouth Rocks.

Class 282.—*Plymouth Rock Cocks.* [8 entries, 1 absent.]

- 2166 I. (20s.).—ARDRON & HOUGHTON, Sysonby Grange Poultry Farm, Melton Mowbray.
2173 II. (10s.).—JOHN TAYLOR, Heaton, Lancaster.
2168 III. (5s.).—DR. J. P. CARTWRIGHT, Brook Street House, Oswestry.
2172 R. N. & H. C.—GEORGE JACKSON, Bolton-le-Sands, Carnforth.

Class 283.—*Plymouth Rock Hens.* [4 entries.]

- 2176 I. (20s.).—GEORGE JACKSON, Bolton-le-Sands, Carnforth.
2177 II. (10s.).—H. WOOLHOUSE, Western Farm, Asfordby, Melton Mowbray.
2174 III. (5s.).—ARDRON & HOUGHTON, Sysonby Grange Farm, Melton Mowbray.
2175 R. N. & H. C.—LORD DE RAMSEY, Haverland Hall, Norwich.

Class 284.—*Plymouth Rock Cockerels.* [12 entries, none absent.]

- 2183 I. (20s.).—GEORGE JACKSON, Bolton-le-Sands, Carnforth.
2178 II. (10s.).—JAMES BATEMAN, Milnthorpe.
2189 III. (5s.).—JOHN TAYLOR, Heaton, Lancaster.
2182 R. N. & H. C.—DR. EDWARD S. JACKSON, Carnforth.

Class 285.—*Plymouth Rock Pullets.* [9 entries, none absent.]

- 2194 I. (20s.), 2193 II. (10s.), & 2195 III. (5s.).—GEORGE JACKSON, Bolton-le-Sands.
2196 R. N. & H. C.—WILLIAM SLATER, Highfield, Lancaster.

Wyandottes.

Class 286.—*Silver Laced Wyandotte Cocks.* [4 entries, 1 absent.]

- 2200 I. (20s.).—HENRY PICKLES, Kayfield House, Earby, Colne.
2199 II. (10s.).—TOM H. FURNESS, The Carlton, Chesterfield.
2201 III. (5s.).—A. C. RUSSELL, The Grange, Eccles, Lancs.

Class 287.—*Silver Laced Wyandotte Hens.* [5 entries, none absent.]

- 2206 I. (20s.).—A. C. RUSSELL, The Grange, Eccles, Lancs.
2204 II. (10s.).—GEORGE HOLMES, Ambergate, Derby.
2207 III. (5s.).—WALTER YOXALL, Oaken, Codsall, Wolverhampton.
2205 R. N. & H. C.—HENRY PICKLES, Kayfield House, Earby, Colne.

Class 288.—*Silver Laced Wyandotte Cockerels.* [10 entries, 1 absent.]

- 2208 I. (20s.).—ARDRON & HOUGHTON, Sysonby Grange Poultry Farm, Melton Mowbray.
2209 II. (10s.).—MRS. CALVERT, Langley Hall Poultry Farm, Warwick Bridge, Carlisle.
2210 III. (5s.).—TOM H. FURNESS, The Carlton, Chesterfield.
2212 R. N. & H. C.—M. G. GOLDSMITH, Blendworth, Horndean, Hants.

Class 289.—Silver Laced Wyandotte Pullets. [10 entries, none absent.]

- 2224 I. (20s.)—LAWRENCE D. HOLT, High Borrans, Windermere.
 2218 II. (10s.)—MRS. CALVERT, Langley Hall Poultry Farm, Warwick Bridge, Carlisle.
 2225 III. (5s.)—J. M. PHILIPSON, Fell House, Haydon Bridge.
 2221 R. N. & H. C.—M. G. GOLDSMITH, Blendworth, Horndean, Hants.

Class 290.—Gold Laced Wyandotte Cocks. [5 entries, 1 absent.]

- 2228 I. (20s.)—BOADEN & THOMAS, Mawgan, Helston, Cornwall.
 2229 II. (10s.)—H. W. BUCKLAND, Rupert House, Lower Wick, Worcester.
 2231 III. (5s.)—PERCY PERCIVAL, Somerset Court, Brent Knoll.
 2230 R. N. & H. C.—J. H. CLARK, Edenton Cottage, Claravale, Ryton-on-Tyne.

Class 291.—Gold Laced Wyandotte Hens. [4 entries, 1 absent.]

- 2233 I. (20s.)—BOADEN & THOMAS, Mawgan, Helston, Cornwall.
 2236 II. (10s.)—PERCY PERCIVAL, Somerset Court, Brent Knoll.
 2234 III. (5s.)—H. W. BUCKLAND, Rupert House, Lower Wick, Worcester.

Class 292.—Gold Laced Wyandotte Cockerels. [5 entries, 1 absent.]

- 2238 I. (20s.)—TOM H. FURNESS, The Carlton, Chesterfield.
 2239 II. (10s.)—M. G. GOLDSMITH, Blendworth, Horndean, Hants.
 2240 III. (5s.)—W. G. KENNEDY, Thanington, Canterbury.
 2241 R. N. & H. C.—TOM WOODCOCK, Burton Fen Poultry Farm, Lincoln.

Class 293.—Gold Laced Wyandotte Pullets. [7 entries, 2 absent.]

- 2243 I. (20s.)—TOM H. FURNESS, The Carlton, Chesterfield.
 2244 II. (10s.)—M. G. GOLDSMITH, Blendworth, Horndean, Hants.
 2248 III. (5s.)—TOM WOODCOCK, Burton Fen Poultry Farm, Lincoln.

Class 294.—Wyandotte Cocks or Cockerels, any other variety.

[8 entries, none absent.]

- 2250 I. (20s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood. (Partridge.)
 2252 II. (10s.)—C. W. DUNN, Mosley Farm, Rolleston-on-Dove, Staffs. (Partridge.)
 2253 III. (5s.)—C. W. DUNN. (White.)
 2249 R. N. & H. C.—ARDRON & HOUGHTON.

Class 295.—Wyandotte Hens or Pullets, any other variety.

[6 entries, none absent.]

- 2257 I. (20s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood. (Partridge.)
 2262 II. (10s.)—G. W. WOOTTON, The Cedars, Nelson Road, Ipswich. (Partridge.)
 2258 III. (5s.)—BOTTISHAM POULTRY FARM, Bottisham House, Cambs. (White.)
 2259 R. N. & H. C.—C. W. DUNN, Mosley Farm, Rolleston-on-Dove, Staffs. (White.)

Orpingtons.**Class 296.—Buff Orpington Cocks.** [12 entries, 3 absent.]

- 2265 I. (20s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood.
 2266 II. (10s.)—W. COOK & SONS, Orpington House, St. Mary Cray.
 2273 III. (5s.)—ALFRED MORRIS, Fuller House, Ponder's End.
 2270 R. N. & H. C.—H. T. HOBART, Elm House, Finchley.

Class 297.—Buff Orpington Hens. [8 entries, 3 absent.]

- 2277 I. (20s.), & 2276 R. N. & H. C.—W. COOK & SONS, Orpington House, St. Mary Cray.
 2282 II. (10s.)—MRS. WILKINSON, Burrow House, Scotforth, Lancs.
 2280 III. (5s.)—A. C. RUSSELL, The Grange, Eccles, Lancs.

Class 298.—Buff Orpington Cockerels. [24 entries, 5 absent.]

- 2299 I. (20s.)—G. C. MONTGOMERY, Orby, Burgh, Lines.
 2305 II. (10s.), & 2306 R. N. & H. C.—MRS. WILKINSON, Burrow House, Scotforth, Lancs.
 2284 III. (5s.)—F. BATEMAN, Collingwood Lodge, Camberley.

Class 299.—Buff Orpington Pullets. [27 entries, 5 absent.]

- 2331 I. (20s.), & 2330 R. N. & H. C.—JAMES TURNER, Bentham Poultry Farm, Bentham.
 2333 II. (10s.)—MRS. WILKINSON, Burrow House, Scotforth, Lancs.
 2312 III. (5s.)—EDWARD A. CASS, Candlesby House, Burgh, R.S.O.

Class 300.—Orpington Cocks, any other variety. [12 entries, none absent.]

- 2335 I. (20s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood. (Black.)
 2339 II. (10s.)—V. B. JOHNSTONE, Ryhall Hall, Stamford. (Black.)
 2337 III. (5s.)—W. COOK & SONS, Orpington House, St. Mary Cray. (Black.)
 2343 R. N. & H. C.—GODFREY SHAW, Heathdene, Haywards Heath. (White.)

Class 301.—*Orpington Hens, any other variety.* [15 entries, 3 absent.]
 2347 I. (20s.), & 2348 III. (5s.)—F. BATEMAN, Collingwood Lodge, Camberley.
 2350 II. (10s.)—W. COOK & SONS, Orpington House, St. Mary Cray. (Black.)
 2354 R. N. & H. C.—V. B. JOHNSTONE, Ryhall Hall, Stamford. (Black.)

Class 302.—*Orpington Cockerels, any other variety.* [8 entries, none absent.]
 2368 I. (20s.)—WILLIAM RICHARDSON, The Rosery, Slinfold, Sussex. (White.)
 2361 II. (10s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood. (Black.)
 2304 III. (5s.), & 2303 R. N. & H. C.—W. COOK & SONS. (White.)

Class 303.—*Orpington Pullets, any other variety.* [7 entries, none absent.]
 2375 I. (20s.)—WILLIAM RICHARDSON, The Rosery, Slinfold, Sussex. (White.)
 2371 II. (10s.)—W. COOK & SONS, Orpington House, St. Mary Cray. (Black.)
 2369 III. (5s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood. (Black.)
 2370 R. N. & H. C.—W. COOK & SONS. (White.)

French.

Class 304.—*Faverolle French Cocks.* [No entries.]

Class 305.—*Faverolle French Hens.* [4 entries.]

2378 I. (20s.), & 2379 II. (10s.)—J. N. F. VALE, Oak House, Eastwood, Ledbury. (Salmon.)
 2376 III. (5s.)—MISS N. EDWARDS, Coaley Poultry Farm, Dursley.
 2377 R. N. & H. C.—NORMAN GALLOWAY, Leybourne Wood, Borough Green. (Salmon.)

Classes 306-309. [No entries.]

Minorcas.

Class 310.—*Minorca Cocks.* [4 entries.]

2381 I. (20s.), & 2382 II. (10s.)—A. G. PITTS, Highbridge.
 2380 III. (5s.)—T. F. HORSLEY, South Grove, Highgate.
 2383 R. N. & H. C.—HERBERT STURCH, Stawell Lodge, Richmond, Surrey.

Class 311.—*Minorca Hens.* [7 entries, none absent.]

2388 I. (20s.)—A. G. PITTS, Highbridge.
 2387 II. (10s.)—S. E. PARKER, 261 Green Lane, Walsall.
 2386 III. (5s.)—J. E. NEAVE, 37 Munster Road, Fulham, S.W.
 2390 R. N. & H. C.—HERBERT STURCH, Stawell Lodge, Richmond, Surrey.

Class 312.—*Minorea Cockerels.* [3 entries, 1 absent.]

2392 I. (20s.)—HERBERT STURCH, Stawell Lodge, Richmond, Surrey.
 2393 III. (5s.)—RICHARD A. WAUGH, Halstead Stud, Sevenoaks.

Class 313.—*Minorca Pullets.* [4 entries, 1 absent.]

2395 II. (10s.)—G. T. KENWORTHY, Broadgate House, Horsforth, Leeds.
 2396 R. N. & H. C.—HERBERT STURCH, Stawell Lodge, Richmond, Surrey.

Leghorns.

Class 314.—*White Leghorn Cocks.* [No entries.]

Class 315.—*White Leghorn Hens.* [6 entries, none absent.]

2400 I. (20s.)—H. W. TYRWHITT DRAKE, Cobtree Farm, Maidstone.
 2403 II. (10s.)—CAPT. W. H. PALMER, Fairfield, Williton, Somerset.
 2398 III. (5s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood.
 2402 R. N. & H. C.—J. S. HARFORD, The Manor House, Bushey.

Class 316.—*Brown Leghorn Cocks.* [No entries.]

Class 317.—*Brown Leghorn Hens.* [3 entries, none absent.]

2405 II. (10s.)—J. CLARKSON, SEN., The Green, Silsden, *via* Keighley.
 2406 III. (5s.)—J. CLARKSON, JUN., The Green, Silsden, *via* Keighley.

Class 318.—*Leghorn Cocks, any other colour.* [5 entries, none absent.]

2407 I. (20s.)—ROBERT CHIPPINDALE, Hampson Green, Ellel, Lancaster. (Buff.)
 2411 II. (10s.)—G. W. WOOTTON, The Cedars, Nelson Road, Ipswich. (Buff.)
 2409 III. (5s.)—G. & R. HENLEY, Grandborough, Winslow. (Pile.)
 2410 R. N. & H. C.—ALBERT MANSELL, Crossrigg, Penrith. (Black.)

Class 319.—*Leghorn Hens, any other colour.* [No entries.]

Anconas.

Classes 320 and 321. [No entries.]

Andalusians.

Class 322.—*Andalusian Cocks or Cockerels*. [3 entries, none absent.]

2413 I. (20s.)—ROBERT LITTLE, JUN., Rokeby Cottage, Glossop.

2414 II. (10s.)—FREDERICK PORTER, High Street, Bridgwater.

Class 323.—*Andalusian Hens or Pullets*. [No entries.]

Any other Recognised Breeds (Bantams excepted).

Class 324.—*Cocks*. [3 entries.]

2416 I. (20s.)—HENRY PICKLES, Kayfield House, Earby, Colne. (Silver Spangle.)

2415 II. (10s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks. (Silver Spangle.)

2417 III. (5s.)—DR. H. C. TITTERTON, Vine Cottage, Norwood Green, Southall. (Black Hamburg.)

Class 325.—*Hens*. [3 entries.]

2420 I. (20s.)—DR. H. C. TITTERTON, Vine Cottage, Norwood Green, Southall. (Black Hamburg.)

2418 II. (10s.)—R. H. LINGWOOD, Riverside Poultry Yard, Needham, Suffolk. (Malay.)

2419 III. (5s.)—HENRY PICKLES, Kayfield House, Earby, Colne. (Silver Spangle.)

Classes 326 and 327. [No entries.]

Table Fowls.

Class 328.—*Pairs of Cockerels, pure-breed*. [6 entries, 1 absent.]

2425 I. (20s.)—HERBERT REEVES, Emsworth, Hants. (Dorkings.)

2422 II. (10s.)—GEORGE FAULKNER, Rowton, Chester. (Indian Game.)

2421 III. (5s.)—THOMAS BRIDEN, Cononley, *via* Keighley. (Coloured Dorkings.)

2424 R. N. & H. C.—A. T. & H. PEARS, Mere, Lincoln. (Dorkings.)

Class 329.—*Pairs of Pullets, pure-breed*. [8 entries, none absent.]

2432 I. (20s.)—HERBERT REEVES, Emsworth, Hants. (Dorkings.)

2427 II. (10s.)—THOMAS BRIDEN, Cononley, *via* Keighley. (Coloured Dorkings.)

2429 III. (5s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks. (Dorkings.)

2428 R. N. & H. C.—GEORGE FAULKNER, Rowton, Chester. (Indian Game.)

Class 330.—*Pairs of Cockerels, cross-breed*. [10 entries, 1 absent.]

2443 I. (20s.)—SHARP BROTHERS, Dingle Farm, Clifton, Kirkham. (Indian Game and Buff Orpington.)

2437 II. (10s.)—W. HAMBLEY, Cutlinwith, St. Germans. (Indian Game and Dorking.)

2436 III. (5s.)—GEORGE FAULKNER, Rowton, Chester. (Indian Game and Dorking.)

2439 R. N. & H. C.—LORD MIDDLETON, Birdsall House, York. (Indian Game and Orpington.)

Class 331.—*Pairs of Pullets, cross-breed*. [9 entries, 1 absent.]

2452 I. (20s.)—SHARP BROTHERS, Dingle Farm, Clifton, Kirkham. (Indian Game and Buff Orpington.)

2453 II. (10s.)—LADY WILSON, Chillingham Barns, Belford. (Dorking and Buff Orpington.)

2448 III. (5s.)—LORD MIDDLETON, Birdsall House, York. (Indian Game and Orpington.)

2446 R. N. & H. C.—W. HAMBLEY, Cutlinwith, St. Germans. (Indian Game and Dorking.)

DUCKS.

Aylesbury.

Class 332.—*Aylesbury Drakes*. [3 entries, 1 absent.]

2456 I. (20s.)—FREDERICK READ, Aston Clinton, Tring.

2455 II. (10s.)—GEORGE NORMAN, Weston Turville, Tring.

Class 333.—*Aylesbury Ducks*. [3 entries, 1 absent.]

2458 I. (20s.)—GEORGE NORMAN, Weston Turville, Tring.

2459 II. (10s.)—FREDERICK READ, Aston Clinton, Tring.

Class 334.—*Aylesbury Young Drakes*. [4 entries, 1 absent.]

2462 I. (20s.), & 2463 II. (10s.)—FREDERICK READ, Aston Clinton, Tring.

2460 III. (5s.)—MRS. HENRY DIGBY, Cosy Nook, Huddersfield.

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Class 335.—*Aylesbury Ducklings.* [4 entries, 1 absent.]

- 2464 I. (20s.)—MRS. HENRY DIGBY, Cosy Nook, Huddersfield.
2466 II. (10s.), & 2467 III. (5s.)—FREDERICK READ, Aston Clinton, Tring.

Rouen.

Class 336.—*Rouen Drakes.* [6 entries, 1 absent.]

- 2468 I. (20s.)—HENRY W. BELL, Caville Hall, Howden.
2469 II. (10s.)—WILLIAM BYGOTT, Ryehill House, Ulceby.
2471 III. (5s.)—A. T. & H. PEARS, Mere, Lincoln.

Class 337.—*Rouen Ducks.* [6 entries, none absent.]

- 2479 I. (20s.)—W. WOODS, Worksop.
2474 II. (10s.)—HENRY W. BELL, Caville Hall, Howden.
2475 III. (5s.)—WILLIAM BYGOTT, Ryehill House, Ulceby.
2477 R. N. & H. C.—A. T. & H. PEARS, Mere, Lincoln.

Pekin. Classes 338 and 339. [No entries.]

Cayuga.

Class 340.—*Cayuga Drakes.* [6 entries, none absent.]

- 2484 I. (20s.), & 2483 II. (10s.)—LADY WILSON, Chillingham Barns, Belford.
2482 III. (5s.)—MRS. A. STRAKER, Leazes, Hexham.
2480 R. N. & H. C.—THE HON. SYBIL AMHERST, Didlington Hall, Brandon.

Class 341.—*Cayuga Ducks.* [4 entries, none absent.]

- 2486 I. (20s.)—THE HON. SYBIL AMHERST, Didlington Hall, Brandon.
2488 II. (10s.)—LADY WILSON, Chillingham Barns, Belford.
2487 III. (5s.)—EDWARD KENDRICK, Weeford House, Lichfield.

Indian Runner.

Class 342.—*Indian Runner Drakes.* [7 entries, none absent.]

- 2493 I. (20s.), & 2492 II. (10s.)—J. DONALD, JUN., Arlosh House, Wigton.
2491 III. (5s.)—MRS. HENRY DIGBY, Cosy Nook, Huddersfield.
2494 R. N. & H. C.—DURRETT BROS., The Lawn, Tuffley, Gloucester.

Class 343.—*Indian Runner Ducks.* [5 entries, none absent.]

- 2500 II. (10s.)—DURRETT BROS., The Lawn, Tuffley, Gloucester.
2497 III. (5s.)—MRS. HENRY DIGBY, Cosy Nook, Huddersfield.
2499 R. N. & H. C.—J. DONALD, JUN., Arlosh House, Wigton.

Any Breeds (Aylesburys excepted) **or Cross Breeds.**

Class 344.—*Pairs of Ducklings.* [3 entries, 1 absent.]

- 2502 I. (20s.)—W. BYGOTT, Ryehill House, Ulceby. (Rouen.)
2504 II. (10s.)—A. T. & H. PEARS, Mere, Lincoln. (Rouen.)

Geese.

Class 345.—*Embsen Ganders.* [4 entries, 2 absent.]

- 2505 I. (30s.)—THE HON. SYBIL AMHERST, Didlington Hall, Brandon.
2508 II. (20s.)—W. WOODS, Worksop.

Class 346.—*Embsen Geese.* [5 entries, 1 absent.]

- 2511 I. (30s.)—J. S. HARFORD, The Manor House, Bushey.
2513 II. (20s.)—W. WOODS, Worksop.
2510 III. (10s.)—WILLIAM BYGOTT, Ryehill House, Ulceby.
2509 R. N. & H. C.—THE HON. SYBIL AMHERST, Didlington Hall, Brandon.

Class 347.—*Toulouse Ganders.* [4 entries, 1 absent.]

- 2514 I. (30s.)—THOMAS ALTHAM, Clifton Arms, Little Marton, Blackpool.
2515 II. (20s.)—WILLIAM BYGOTT, Ryehill House, Ulceby.
2517 III. (10s.)—W. WOODS, Worksop.

Class 348.—*Toulouse Geese.* [3 entries.]

- 2520 I. (30s.)—W. WOODS, Worksop.
2518 II. (20s.)—THOMAS ALTHAM, Clifton Arms, Little Marton, Blackpool.
2519 III. (10s.)—W. G. WATSON, Hurst Road, Horsham.

Turkeys.

Class 349.—*Turkey Cocks.* [9 entries, 1 absent.]

- 2529 I. (30s.)—W. WOODS, Worksop. (American Bronze.)
 2526 II. (20s.)—F. H. JENNINGS, Cockfield Hall, Bury St. Edmunds. (Bronze.)
 2521 III. (10s.)—W. COOK & SONS, Orpington House, St. Mary Cray. (American Bronze.)
 2524 R. N. & H. C.—A. GOODWIN, Partney Mill, Spilsby. (Mammoth Bronze.)

Class 350.—*Turkey Hens.* [8 entries, none absent.]

- 2534 I. (30s.)—EDWARD KENDRICK, Weeford House, Lichfield. (Bronze.)
 2533 II. (20s.)—F. H. JENNINGS, Cockfield Hall, Bury St. Edmunds. (Bronze.)
 2530 III. (10s.)—LADY DE ROTHCHILD, Aston Clinton, Tring. (Cambridge Bronze.)
 2537 R. N. & H. C.—W. WOODS, Worksop. (American Bronze.)

New-Laid Hens' Eggs.

Class 351.—*Cases of 120 New-laid Hens' Eggs, white shell.*

[9 entries, none absent.]

- 2545 I. (20s.)—STREET & DISTRICT COLLECTING DEPOT, LTD., N.P.O.S., High Street, Street. (Various breeds.)
 2542 II. (10s.)—T. F. HORSLEY, South Grove, Highgate. (Minorca.)
 2541 III. (5s.)—FRAMLINGHAM & DISTRICT AGRICULTURAL CO-OPERATIVE SOCIETY, LTD., N.P.O.S., Framlingham. (Minorca and Leghorn.)
 2543 R. N. & H. C.—MILNTHORPE DEPOT, N.P.O.S., Milnthorpe.

Class 352.—*Cases of 120 New-laid Hens' Eggs, brown or tinted shell.*

[11 entries, none absent.]

- 2555 I. (20s.)—STREET & DISTRICT COLLECTING DEPOT, LTD., N.P.O.S., High Street, Street. (Various breeds.)
 2550 II. (10s.)—FRAMLINGHAM & DISTRICT AGRICULTURAL CO-OPERATIVE SOCIETY, LTD., N.P.O.S., Framlingham. (Langshan, Orpington, and Cochin.)
 2551 III. (5s.)—T. F. HORSLEY, South Grove, Highgate. (Crossbreeds.)
 2552 R. N. & H. C.—MILNTHORPE DEPOT, N.P.O.S., Milnthorpe.

Breeding Pens.

Class 353.—*Breeding Pens, any variety of Indian Game.* [3 entries.]

- 2559 I. (30s.)—FIRTH BROS., Wharton Farm, Acton Vale, W.
 2558 II. (20s.)—GEORGE FAULKNER, Rowton, Chester.
 2560 R. N. & H. C.—LORD MIDDLETON, Birdsall House, York.

Class 354.—*Breeding Pens, any variety of Dorking.* [4 entries.]

- 2561 I. (30s.)—CHARLES AITKENHEAD, Stud Farm, Seaham Harbour.
 2562 II. (20s.)—VISCOUNT DEERHURST, Dynes Hall, Halstead, Essex.
 2564 III. (10s.)—HERBERT REEVES, Emsworth, Hants.
 2563 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

Class 355.—*Breeding Pens, any variety of Plymouth Rock or Wyandotte.*

[4 entries.]

- 2568 I. (30s.)—COL. S. SANDBACH, Hafodunos, Abergele. (Partridge Wyandotte.)
 2566 II. (20s.)—SAMUEL DONKIN, The Pheasantry, Studley, R.S.O. (Plymouth Rock.)
 2567 III. (10s.)—HOWARD ROWLANDSON, Wickelwood Grove, Wymondham. (White Wyandotte.)
 2565 R. N. & H. C.—CECIL CHADWICK-CLARK, Foxley's Farm House, Touchen End, Maidenhead. (White Wyandotte.)

Class 356.—*Breeding Pens, any variety of Orpington.* [5 entries, 2 absent.]

- 2569 I. (30s.)—W. M. BELL, St. Leonard's Poultry Farm, Ringwood. (Black.)
 2571 II. (20s.)—W. COOK & SONS, Orpington House, St. Mary Cray. (Black.)
 2573 III. (10s.)—COL. S. SANDBACH, Hafodunos, Abergele. (Black.)

Class 357.—*Breeding Pens, any variety of Minorca or Leghorn.*

[No entries.]

Class 358.—*Breeding Pens, any other variety.* [6 entries, none absent.]

- 2575 I. (30s.)—MESDAMES HILL & MACONOCHE, Tovil, Maidstone. (Houdan.)
 2574 II. (20s.)—F. R. EATON, Cleveland House, Eaton, Norwich. (Black Sumatra.)
 2577 III. (10s.)—HENRY PICKLES, Kayfield House, Earby, Colne. (Silver Spangle.)
 2576 R. N. & H. C.—R. H. LINGWOOD, Riverside Poultry Yard, Needham (Cochin.)

Class 359.—Breeding Pens, any variety of White Ducks.
[5 entries, none absent.]

- 2583 I. (30s.) & 2584 II. (20s.)—FREDERICK READ, Aston Clinton, Tring. (Aylesbury.)
2582 III. (10s.)—GEORGE NORMAN, Weston Turville, Tring. (Aylesbury.)
2580 R. N. & H. C.—T. & W. BROWN, College Poultry Farm, Theale, Berks. (Aylesbury.)

Class 360.—Breeding Pens, any variety of coloured Ducks. [3 entries.]

- 2585 I. (30s.)—WILLIAM BYGOTT, Rychill House, Ulceby. (Rouen.)
2587 II. (20s.)—A. T. & H. PEARS, Mere, Lincoln. (Rouen.)
2586 III. (10s.)—FRANK MOODY, Rychill, Ulceby. (Rouen.)

FARM AND DAIRY PRODUCE OF THE UNITED KINGDOM.

Butter.

Class 361.—Kegs or other Packages of Butter, not less than 14 lb. and under 40 lb. in weight, delivered on or before Saturday, May 7, 1904.
[10 entries, none absent.]

- 2591 I. (£4.)—CHARLES HAYES, Summerlea House, Mere, Wilts. (Channel Island Cows: Cream raised in shallow pans, churned at 52°, and dry salted. May 6.)
2589 II. (£2.)—BELLEEK CO-OPERATIVE DAIRY SOCIETY, Belleek, co. Fermanagh. (Mixed breed of Cows: Mechanically separated cream, churned at 56°, and dry salted. May 6.)
2590 R. N. & H. C.—GLENWILLIAM CO-OPERATIVE DAIRY SOCIETY, LTD., Ballingarry, co. Limerick. (Mixed breed of Kerry, Dexter, and Ayrshire Cows: Mechanically separated cream, churned at 48°, and dry salted. May 6.)

Class 362.—Boxes of Twelve Pound Rolls of Butter, made with not more than 1 per cent. of salt. [14 entries, 1 absent.]

- 2610 I. (£4.)—URNEY CO-OPERATIVE DAIRY SOCIETY, LTD., Urney, co. Tyrone.
2607 II. (£2.)—MISS MABEL G. PRIDEAUX, The Grange, Motcombe, Shaftesbury.
2603 III. (£1.)—IRISH CO-OPERATIVE AGENCY SOCIETY (RATHDUFF DAIRY), Rathduff, Blarney, co. Cork.
2605 R. N. & H. C.—KILMALLOCK CREAMERY COMPANY, Kilmallock, co. Limerick.

Class 363.—Two Pounds Fresh Butter, slightly salted, made up in Pounds.
[41 entries, 2 absent.]

- 2612 (£2.)—MRS. GEORGE ADLAM, Wookey Hole, Wells.
2613 (£2.)—MRS. M. BAINES, West End Farm, Henfield.
2636 (£2.)—MRS. L. R. MILDON, Higher Mead Down, Rackenford, Morchard Bishop.
2646 (£2.)—W. G. M. TOWNLEY, Hard Cragg, Grange-over-Sands.
2619 (£1.)—LADY DE ROTHSCHILD, Aston Clinton, Tring.
2641 (£1.)—THE HON. MRS. PORTMAN, Hestercombe, Taunton.
2649 (£1.)—MRS. FRANK WARD, Burnville, Tavistock.
2652 (£1.)—MISS WYLES, Bassingfield, Nottingham.
2615 (10s.)—GROSVENOR BERRY, Chaldea's Farm, Much Hadham.
2638 (10s.)—ALFRED PALMER, Wokefield Park, Mortimer.
2639 (10s.)—MRS. E. DICKSON PARK, Sedgmoor, Loudwater.
2644 (10s.)—SOLOHEAD CO-OPERATIVE DAIRY SOCIETY, LTD., Limerick Junction.
2614 R. N. & H. C.—BELLEEK CO-OPERATIVE DAIRY SOCIETY, Belleek, co. Fermanagh.

Class 364.—Two Pounds Fresh Butter, slightly salted, made up in Pounds from milk drawn from Cows other than Channel Islands, or Cows crossed with Channel Islands Breeds. [27 entries, 1 absent.]

- 2653 (£2.)—MRS. GEORGE ADLAM, Wookey Hole, Wells.
2663 (£2.)—A. H. KINGSLEY, Fanshaws, Hertford.
2665 (£2.)—MRS. L. R. MILDON, Higher Mead Down, Rackenford, Morchard Bishop.
2673 (£2.)—SOLOHEAD CO-OPERATIVE DAIRY SOCIETY, LTD., Limerick Junction.
2668 (£1.)—MRS. E. DICKSON PARK, Sedgmoor, Loudwater.
2675 (£1.)—W. G. M. TOWNLEY, Hard Cragg, Grange-over-Sands.
2676 (£1.)—MISS A. A. WALKER, Whitlocks End, Dymock.
2678 (£1.)—MRS. FRANK WARD, Burnville, Tavistock.
2654 (10s.)—MRS. M. BAINES, West End Farm, Henfield.
2659 (10s.)—THE HON. A. HOLLAND-HIBBERT, Munden, Watford.
2664 (10s.)—JOHN R. T. KINGWELL, Great Aish, South Brent.
2667 (10s.)—ALFRED PALMER, Wokefield Park, Mortimer.
2666 R. N. & H. C.—JOHN NEAVEYSON, Eye, Peterborough.

Cheese.

Made in 1904.

Class 365.—*Three Cheddar Cheeses, of not less than 50 lb. each.*
[14 entries, none absent.]

- 2691 I. (£5.)—HARRY TRAVERS, Middle Farm, Sutton, Ditchat, Bath.
2682 II. (£3.)—MRS. C. CANDY, Temple House Farm, Doultling, Shepton Mallet.
2689 III. (£2.)—W. C. SPENCER, North Perrott, Crewkerne.
2684 IV. (£1.)—G. HISCOCK & CO., Stourton Farm, Stourton, Bath.
2692 R. N. & H. C.—TOM TUCKER, Mill Farm, Steeple Ashton, Trowbridge.

Class 366.—*Three Cheshire Cheeses, of not less than 40 lb. each.*
[10 entries, none absent.]

- 2702 I. (£5.)—MRS. WHALLEY, Frankton, Oswestry.
2703 II. (£3.)—RICHARD WALLEY, Cotton Abbots, Waverton, Chester.
2701 III. (£2.)—THOMAS NUNNERLEY, Bradeley Green, Whitechurch, Salop.
2694 IV. (£1.)—THOMAS BATHO, New Marton, Chirk, Ruabon.
2700 R. N. & H. C.—RICHARD MULLOCK, Guy Lane Farm, Waverton, Chester.

Class 367.—*Three Stilton Cheeses.* [7 entries, none absent.]

- 2706 I. (£4.)—GEORGE HODGKINSON, Kirby Bellars, Melton Mowbray.
2709 II. (£3.)—JOHN SMITH, Gaddesby, Leicester.
2707 III. (£2.)—HERBERT KIRK, Stathern Lodge, Melton Mowbray.

Class 368.—*Three Wensleydale Cheeses (Stilton Shape).*
[6 entries, none absent.]

- 2714 I. (£4.)—JOHN STUBBS, Swinethwaite, Leyburn, R.S.O.
2713 II. (£3.)—ALFRED ROWNTREE, Field House, Kirkby Overblow, Pannal S.O.

Class 369.—*Three Double Gloucester Cheeses.* [4 entries, none absent.]

- 2717 I. (£4.)—G. HISCOCK & CO., Stourton Farm, Stourton, Bath.
2718 II. (£3.)—C. T. PARRETT, Mitford Bridge, Shipston-on-Stour.

Class 370.—*Three Wiltshire Cheeses (Lanf or Flat) not exceeding 16 lb. each.*
[4 entries, none absent.]

- 2721 I. (£4.)—JOHN ASHEY, Spiers Piece, Steeple Ashton, Trowbridge.
2722 II. (£3.)—G. HISCOCK & CO., Stourton Farm, Stourton, Bath.

Class 371.—*Three Cheddar Truckle Cheeses.* [10 entries, none absent.]

- 2725 I. (£2.)—JOHN ASHEY, Spiers Piece, Steeple Ashton, Trowbridge.
2727 II. (£1.)—MRS. C. CANDY, Temple House Farm, Doultling, Shepton Mallet.
2729 R. N. & H. C.—MRS. L. A. GRIFFIN, Dibden's Farm, Backwell, West Town, Bristol.

Class 372.—*Three Leicester Cheeses.*
[No entry.]

Class 373.—*Three Curphyll Cheeses.* [3 entries.]

- 2737 I. (£2.)—C. M. PERRY, Batch Farm, Panboro', Wells.
2736 II. (£1.)—F. A. MOON, Model Farm, Huntspill, Bridgwater.
2735 R. N. & H. C.—MRS. F. MOON, Merry Farm, Bason Bridge, Highbridge.

Classes 374-380.—*Cream and French Cheeses.* [No entries.]

Cider and Perry.

N.B.—The names of the Fruits from which the Cider and Perry is stated by the Exhibitor to have been made are added after the address of the Exhibitor.

Class 381.—*Casks of Cider, of not less than 18, and not more than 30 gallons, made in the autumn of 1903.* [14 entries, 1 absent.]

- 2741 I. (£5.)—HERBERT J. DAVIS, Hurlingpot, Shepton Mallet. (Yarlington Mills and Cap of Liberty.)
2749 II. (£3.)—W. T. S. & H. A. TILLEY, East Compton, Shepton Mallet. (White Jersey, New Cadbury, and Dove.)
2742 III. (£2.)—HERBERT J. DAVIS. (Red, White, and Royal Jerseys and Cap of Liberty.)
2740 R. N. & H. C.—D. J. CROFTS & SON, Sutton Montis, Sparkford, Somerset. (Royal and White Jerseys, White Close Pippin, Cadbury, and Kingston Black.)

Class 382.—*One Dozen Bottles of Cider, made in the autumn of 1903.*
[27 entries, none absent.]

- 2759 I. (£5.)—HERBERT J. DAVIS, Hurlingpot, Shepton Mallet. (Red, White, and Royal Jerseys, and Cap of Liberty.)

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2758 II. (£3.)—HERBERT J. DAVIS. (Yarlington Mills and Cap of Liberty.)
 2760 III. (£2.)—HERBERT J. DAVIS. (Harry Masters, Royal Jersey, and Cap of Liberty.)

2773 R. N. & H. C.—W. T. S. & H. A. TILLEY. (Mixed Fruit.)

Class 383.—*One Dozen Bottles of Cider, made in any year before 1903.*
 [18 entries, none absent.]

2783 I. (£5.)—HERBERT J. DAVIS, Hurlingpot, Shepton Mallet. (Silver Cup and Cap of Liberty, 1902.)

2794 II. (£3.)—W. T. S. & H. A. TILLEY, East Compton, Shepton Mallet. (White Jersey, Horner, Dark Nortons Bitter, 1902.)

2782 III. (£2.)—D. J. CROFTS & SON, Sutton Montis, Sparkford, Somerset. (Royal and White Jerseys, White Close Pippin, Cadbury, and Kingston Black, 1901.)

Class 384.—*One Dozen Bottles of Perry.* [6 entries, none absent.]

2798 I. (£5.)—DANIEL PHELPS, Tibberton, Gloucester. (Huff Caps and Oldfield, 1902.)

2797 II. (£3.)—ALBERT KNIGHT, Deep Filling Farm, Huntley, Gloucester. (Oldfield, 1901.)

2799 III. (£2.)—JAMES SLATTER & Co., Paxford, Campden, Glos. (Oldfield, 1901.)

2800 R. N. & H. C.—SWANLEY CYDER CO., Wested, Swanley. (Oldfield and Gold, 1902.)

Corn.

Class 385.—*Sacks of White Wheat.* [4 entries, none absent.]

2804 I. (£3.)—BEN. SLADE, Thorpe Farm, Aston Upthorpe, Wallingford. (Rough Chaff.)

2803 II. (£2.)—LEOPOLD CAUDWELL, Drayton Manor, Abingdon. (Rough Chaff.)

2805 III. (£1.)—FREDERICK A. SMITH, The Home Farm, East Hendred, Steventon, Berks. (Long-eared Essex Rough Chaff.)

Class 386.—*Sacks of Red Wheat.* [5 entries, none absent.]

2807 I. (£3.)—F. F. BETTERIDGE, Radley, Abingdon. (Golden Drop.)

2811 II. (£2.)—JOSEPH SHAKESHAFT, Cherry Lane Farm, Lymm. (Garton's New Era.)

2810 III. (£1.)—STEPHEN PULLEN, Frogmore Farm, Hayes, Middlesex. (Carter's Red Stand Up.)

Class 387.—*Sacks of Barley.* [4 entries, 1 absent.]

2813 I. (£3.)—H. S. DAINE, Woolfall Hall Farm, Huyton, Liverpool. (The Maltster.)

2815 II. (£2.)—RICHARD PREECE, Cressage, Salop. (Webb's Kinver Chevalier.)

2814 III. (£1.)—E. HORSEMAN, Broken Briar Farm, Richmond, Yorks. (Standwell.)

Class 388.—*Sacks of White Oats.* [6 entries, none absent.]

2818 I. (£3.)—H. S. DAINE, Woolfall Hall Farm, Huyton, Liverpool. (Abundance.)

2817 II. (£2.)—H. S. DAINE. (Storm King.)

2821 III. (£1.)—J. SHAKESHAFT, Cherry Lane Farm, Lymm. (Garton's Storm King.)

Class 389.—*Sacks of Black Oats.* [4 entries, none absent.]

2824 I. (£3.)—STEPHEN PULLIN, Frogmore Farm, Hayes. (Carter's Black Tartarian.)

2823 II. (£2.)—C. E. NICKOLLS, The Cottage, Enville, Stourbridge. (Webb's Black.)

2822 III. (£1.)—H. S. DAINE, Woolfall Hall Farm, Huyton, Liverpool. (Excelsior.)

Classes 390 and 391.—*Beans and Peas.* [No entries.]

Wool.

Class 392.—*Three Fleeces of Leicester or Border Leicester Wool.*

[6 entries, none absent.]

2831 I. (£3.), & 2830 II. (£2.)—MRS. S. PERRY-HERRICK, Beau Manor Park, Loughborough. (Leicester.)

2829 III. (£1.)—WILLIAM LEATHES, Wern Fawr, Ruthin. (Border Leicester.)

2826 R. N. & H. C.—JOHN DOWSON, Danby Castle, Danby End, Yorks. (Leicester.)

Class 393.—*Three Fleeces of Lincoln Wool.* [4 entries, none absent.]

2832 I. (£3.)—HENRY DUDDING, Riby Grove, Great Grimsby.

2833 II. (£2.)—W. B. SWALLOW, Wootton Lawn, Ulceby.

2835 III. (£1.)—SIR JOHN H. THOROLD, BT, Syston Park, Grantham.

Class 394.—*Three Fleeces of any other Long Wool.* [10 entries, 1 absent.]

2836 I. (£3.), & 2837 R. N. & H. C.—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale. (Wensleydale Bluefaced.)

2842 II. (£2.)—HENRY RIGDEN, Etchinghill, Lyminge, S.O. (Romney Marsh.)

2843 III. (£1.)—A. C. SKINNER, Pound Farm, Bishops Lydeard. (Devon Long Wool.)

Class 395.—*Three Fleeces of Southdown Wool.* [5 entries, none absent.]

2847 I. (£3.), & 2848 II. (£2.)—LORD CALTHORPE, Elvetham Park, Winchfield.

2850 III. (£1.)—THOMAS MILES, Buckwell, Wye.

Class 396.—*Three Fleeces of Shropshire Wool.* [5 entries, none absent.]

- 2852 I. (£3.)—WILLIAM LEATHES, Wern Fawr, Ruthin.
 2854 II. (£2.)—ALFRED TANNER, Shrawardine, Shrewsbury.
 2853 III. (£1.)—SAMUEL SMITH, Woodmanton, Hereford.

Class 397.—*Three Fleeces of any other Short Wool.* [9 entries, 1 absent.]

- 2860 I. (£3.), & 2861 R. N. & H. C.—W. H. DAVIES, Claston and Liver's Oele, Hereford. (Ryeland.)
 2863 II. (£2.)—W. R. FLOWER, West Stafford, Dorchester. (Dorset Horn.)
 2856 III. (£1.)—ALFRED APPERLY, Rodborough Court, Stroud. (Hampshire Down.)

Class 398.—*Three Fleeces of Welsh Wool.* [5 entries, none absent.]

- 2869 I. (£3.), & 2868 II. (£2.)—WILLIAM LEATHES, Wern Fawr, Ruthin.
 2865 III. (£1.), & 2866 R. N. & H. C.—W. CONWY BELL, Bryn-y-flynnon, Rhuddlan, R.S.O.

Class 399.—*Three Fleeces of Scotch Wool.* [7 entries, 1 absent.]

- 2870 I. (£3.)—JOHN DARGUE, Burneside Hall, Kendal. (Black-faced Mountain.)
 2873 II. (£2.)—TOM IRVING, Forest Hall, Kendal.
 2876 III. (£1.)—F. H. D. C. WHITMORE, Orsett Hall, Grays. (Cheviot.)

Hops.

Class 400.—*Samples of East Kent Hops.* [3 entries.]

- 2879 I. (£4.)—H. FITZWALTER PLUMPTRE, Goodnestone, Dover. (Golding.)
 2878 II. (£3.)—LORD HARRIS, Belmont, Faversham. (Golding.)
 2877 III. (£1.)—ALFRED AMOS, Spring Grove Farm, Wye. (Golding.)

Class 401.—*Samples of Mid Kent Hops.* [3 entries, 2 absent.]

- 2881 I. (£4.)—WILLIAM ROGERS, Court Lodge, Horton Kirby, Kent. (Brambling.)

Classes 402-404. [No entries.]**Class 405.**—*Samples of Hereford or Worcester Hops.*

[5 entries, none absent.]

- 2886 I. (£4.)—W. F. PUDGE, Upper House, Bishops Frome. (Mathon White.)
 2885 II. (£3.)—E. G. PUDGE, New House, Bishops Frome. (Mathon.)
 2887 III. (£1.)—W. F. PUDGE. (Brambling.)

HIVES, HONEY, AND BEE APPLIANCES.¹**Class 406.**—*Collections of Hives and Appliances.* [3 entries.]

- 2888 I. (£4.)—JAMES LEE & SON, 4 Martineau Road, Highbury, N.
 2889 II. (£2.)—W. P. MEADOWS, Syston, Leicester.
 2890 III. (£1.)—E. H. TAYLOR, Welwyn, Herts.

Class 407.—*Frame Hives, for general use, unpainted.* [8 entries, 1 absent.]

- 2894 I. (20s.)—JAMES LEE & SON, 4 Martineau Road, Highbury, N.
 2896 II. (15s.), & 2897 III. (10s.)—W. P. MEADOWS, Syston, Leicester.
 2898 R. N. & H. C.—E. H. TAYLOR, Welwyn, Herts.

Class 408.—*Frame Hives, for Cottager's use, unpainted.*

[6 entries, none absent.]

- 2901 I. (20s.)—JAMES LEE & SON, 4 Martineau Road, Highbury, N.
 2903 II. (15s.) & 2902 R. N. & H. C.—W. P. MEADOWS, Syston, Leicester.
 2904 III. (10s.)—E. H. TAYLOR, Welwyn, Herts.

Class 409.—*Honey Extractors.*² [4 entries, none absent.]

- 2905 I. (15s.), 2907 II. (10s.), & 2906 Certificate of Merit.—W. P. MEADOWS, Syston.

Class 410.—*Observatory Hives, not exceeding three Frames, with Bees and Queen.* [4 entries, none absent.]

- 2910 I. (20s.)—JAMES LEE & SON, 4 Martineau Road, Highbury, N.
 2912 II. (15s.)—SIR H. F. DE TRAFFORD, BT., Hill Crest, Market Harborough.
 2911 III. (10s.)—E. H. TAYLOR, Welwyn, Herts.

¹ Prizes given by the British Bee-keepers' Association.² Prizes in Class 409 given by Mr. T. W. Cowan.

cxlviii *Award of Produce Prizes at Park Royal, 1904.*

Class 411.—*Any appliances connected with Bee-keeping, to which no prize has been awarded at a Show of the R.A.S.E.* [9 entries, 2 absent.]

2915 I. (10s.)—JAMES LEE & SON, 4 Martineau Road, Highbury, N. "Swarthmore" Queen Raising Outfit.

2917 Certificate of Merit.—W. P. MEADOWS, Syston, Leicester. Queen Rearing Outfit.

2919 Certificate of Merit.—W. P. MEADOWS. New Rapid Heating Wax Extractor.

Class 412.—*Comb Honey.*¹ [5 entries, 1 absent.]

2926 I. (15s.)—E. C. R. WHITE, Newton Toney, Salisbury.

2922 II. (10s.)—JOHN EDWARDS, Callington, Cornwall.

2923 Certificate of Merit.—P. B. GOVETT, Tideford, St. Germans.

Class 413.—*Run or Extracted Light-coloured Honey.* [7 entries, 2 absent.]

2928 I. (15s.)—JOHN EDWARDS, Callington, Cornwall.

2927 II. (10s.)—F. CHAPMAN, Somerset House, Ludgershall, Wilts.

2933 Certificate of Merit.—MRS. H. H. WOOSNAM, Hope, Kingsbridge.

2932 R. N. & H. C.—E. C. R. WHITE, Newton Toney, Salisbury.

Class 414.—*Run or Extracted Medium or Dark-coloured Honey.*
[8 entries, 2 absent.]

2937 I. (15s.)—F. A. KENT, Greenhill House, Fordington, Dorchester.

2938 II. (10s.)—CHARLES SQUIRE, Morteheo, North Devon.

2935 Certificate of Merit.—JOHN EDWARDS, Callington, Cornwall.

2934 R. N. & H. C.—THE REV. W. E. BURKITT, Buttermere Rectory, Hungerford.

Class 415.—*Granulated Honey.* [10 entries, 1 absent.]

2950 I. (15s.)—E. C. R. WHITE, Newton Toney, Salisbury.

2946 II. (10s.)—F. A. KENT, Greenhill House, Fordington, Dorchester.

2951 Certificate of Merit.—MRS. H. H. WOOSNAM, Hope, Kingsbridge.

2947 R. N. & H. C.—JOHN R. T. KINGWELL, Great Aish, South Brent.

Class 416.—*Comb Honey.*² [12 entries, 6 absent.]

2963 I. (15s.)—W. WOODLEY, Beedon, Newbury.

2952 II. (10s.)—WILLIAM BLAKEMAN, Ovington, Alresford.

2956 Certificate of Merit.—H. D. DAVIDSON, Beecroft, Basingstoke.

Class 417.—*Run or Extracted Light-coloured Honey.* [10 entries, 3 absent.]

2968 I. (15s.)—JAMES LEE & SON, Monks Acre, Andover.

2973 II. (10s.)—W. WOODLEY, Beedon, Newbury.

2970 Certificate of Merit.—FRED. POWERS, 10 East Street, Andover.

Class 418.—*Run or Extracted Medium or Dark-coloured Honey.*
[5 entries, 2 absent.]

2977 I. (15s.)—JAMES LEE & SON, Monks Acre, Andover.

Class 419.—*Granulated Honey.* [4 entries, 1 absent.]

2982 I. (15s.)—W. WOODLEY, Beedon, Newbury.

2980 II. (10s.)—JAMES LEE & SON, Monks Acre, Andover.

Class 420.—*Comb Honey.*³ [6 entries, 3 absent.]

2985 I. (15s.)—C. LODGE, High Easter, Chelmsford.

2987 II. (10s.)—WALTER TURNER, Langley House, Brent Eleigh, Lavenham.

2986 Certificate of Merit.—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.

Class 421.—*Run or Extracted Light-coloured Honey.* [9 entries, 2 absent.]

2995 I. (15s.)—S. P. SOAL, Reliable Bee Farm, Roehford, Essex.

2993 II. (10s.)—C. LODGE, High Easter, Chelmsford.

2994 Certificate of Merit.—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.

2990 R. N. & H. C.—CHARLES H. BOCOCK, Ashley Apiaries, Newmarket.

Class 422.—*Run or Extracted Medium or Dark-coloured Honey.*
[3 entries, 1 absent.]

3000 I. (15s.)—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.

2999 II. (10s.)—C. LODGE, High Easter, Chelmsford.

¹ Entries in Classes 412-415 limited to Bee-keepers resident in Cornwall, Devon, Somerset, Dorset, or Wilts.

² Entries in Classes 416-419 limited to Bee-keepers resident in Berkshire, Hampshire, Isle of Wight, Surrey, Sussex, or Kent.

³ Entries in Classes 420-423 limited to Bee-keepers resident in Suffolk, Essex, Bucks, Middlesex, Herts, or Oxon.

Class 423.—Granulated Honey. [4 entries, 1 absent.]

3003 I. (15s.)—C. LODGE, High Easter, Chelmsford.

3004 II. (10s.)—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.

Class 424.—Comb Honey.¹ [6 entries, 1 absent.]

3008 I. (15s.)—G. HILLS, Comberton, Cambridge.

3006 II. (10s.)—R. BROWN, Flora Apiary, Somersham.

Class 425.—Run or Extracted Light-coloured Honey. [4 entries, 2 absent.]

3011 I. (15s.)—JAMES ADAMS, West Haddon, Rugby.

3013 II. (10s.)—R. BROWN, Flora Apiary, Somersham.

Class 426.—Run or Extracted Medium or Dark-coloured Honey.
[7 entries, 1 absent.]

3016 I. (15s.)—R. BROWN, Flora Apiary, Somersham.

3019 II. (10s.)—F. J. OLD, Chapel Place, Piddington, Northampton.

3020 Certificate of Merit.—MRS. SPENCER, St. Oswald's Apiary, Holywell Manor, St. Ives.

Class 427.—Granulated Honey. [3 entries, none absent.]

3023 I. (15s.)—J. BARNES, Ivy Apiary, Burwell, Cambs.

3024 II. (10s.)—R. BROWN, Flora Apiary, Somersham.

Class 428.—Comb Honey.² [10 entries, 6 absent.]

3028 Certificate of Merit.—A. HAMER, Llandilo Bridge Station, Llandilo.

Class 429.—Run or Extracted Light-coloured Honey. [8 entries, 2 absent.]

3036 I. (15s.)—A. HAMER, Llandilo Bridge Station, Llandilo.

3040 II. (10s.)—A. G. PREEN, Mount View, Nesscliffe, Shrewsbury.

3039 Certificate of Merit.—G. W. KIRBY, 10 Summerhill Road, St. George, Bristol.

3035 R. N. & H. C.—J. BOYES, Queen's Head Hotel, Cardiff.

Class 430.—Run or Extracted Medium or Dark-coloured Honey
[8 entries, 1 absent.]

3048 I. (15s.)—G. W. KIRBY, 10 Summerhill Road, St. George, Bristol.

3050 II. (10s.)—G. M. TUNE, The Woodlands, Fronsylvite, Llangollen.

3046 Certificate of Merit.—JOHN HELME, Norton Canon, Weobley.

Class 431.—Granulated Honey. [5 entries, 1 absent.]

3053 I. (15s.)—JOHN HELME, Norton Canon, Weobley.

3051 II. (10s.)—JOHN ARTHURS, Studley, R.S.O.

Class 432.—Comb Honey.³ [9 entries, 4 absent.]

3064 I. (15s.)—A. W. WEATHERHOGG, Willoughton, Lincoln.

3062 II. (10s.)—MISS HELENA RATCLIFFE, Barthomley, Crewe.

3056 Certificate of Merit.—J. M. BALMBRA, East Parade, Alnwick.

Class 433.—Run or Extracted Light-coloured Honey. [8 entries, 1 absent.]

3067 I. (15s.)—G. H. GARNER, Oxford Road, Altrincham.

3070 II. (10s.)—T. S. HOLDSWORTH, Woodford House, Kirton Lindsey.

3065 Certificate of Merit.—W. J. COOK, Binbrook, Market Rasen.

3071 R. N. & H. C.—J. PEARMAN, Penny Long Lane, Derby.

Class 434.—Run or Extracted Medium or Dark-coloured Honey.
[4 entries, none absent.]

3075 I. (15s.)—A. G. PUGH, Beech House, Beeston, Notts.

3074 II. (10s.)—T. S. HOLDSWORTH, Woodford House, Kirton Lindsey.

3076 Certificate of Merit.—THOMAS RICHARDS, 71 Wood Street, Church Gresley, Burton-on-Trent.

Class 435.—Granulated Honey. [7 entries, 1 absent.]

3082 I. (15s.)—ALBERT F. RUSSELL, Wyham House, Louth.

3088 II. (10s.)—A. W. WEATHERHOGG, Willoughton, Lincoln.

3081 Certificate of Merit.—A. G. PUGH, Beech House, Beeston, Notts.

3077 R. N. & H. C.—F. W. FRUSHER, Swiss Apiary, New Road, Crowland, Lines.

¹ Entries in Classes 424-427 limited to Bee-keepers resident in Norfolk, Cambridge, Hunts, Bedfordshire, Leicestershire, or Northamptonshire.² Entries in Classes 428-431 limited to Bee-keepers resident in Gloucestershire, Monmouthshire, Worcestershire, Herefordshire, Warwickshire, Shropshire, or Wales.³ Entries in Classes 432-435 limited to Bee-keepers resident in Nottinghamshire, Lincolnshire, Rutland, Cheshire, Derbyshire, Staffordshire, Yorkshire, Lancashire, Northumberland, Durham, Cumberland, Westmorland, Isle of Man, Scotland, or Ireland.

Class 436.—*Best and Most Attractive Displays of Honey.*
[7 entries, 2 absent.]

- 3089 I. (30s.)—J. PEARMAN, Penny Long Lane, Derby.
3084 II. (20s.)—R. BROWN, Flora Apiary, Somersham, Hunts.
3088 III. (10s.)—C. LODGE, High Easter, Chelmsford.

Class 437.—*Exhibits of not less than 2 lb. of Wax, the Produce of the Exhibitor's Apiary.* [17 entries, 3 absent.]

- 3107 I. (10s.)—E. C. R. WHITE, Newton Toney, Salisbury.
3099 II. (7s. 6d.)—C. LODGE, High Easter, Chelmsford.
3103 III. (5s.)—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.
3104 R. N. & H. C.—S. P. SOAL, Reliable Bee Farm, Rochford.

Class 438.—*Exhibits of not less than 3 lb. of Wax, the Produce of the Exhibitor's Apiary, suitable for the retail trade.* [10 entries, 2 absent.]

- 3117 I. (10s.)—E. C. R. WHITE, Newton Toney, Salisbury.
3116 II. (7s. 6d.)—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.
3111 III. (5s.)—G. W. KIRBY, 10 Summerhill Road, St. George, Bristol.
3115 R. N. & H. C.—J. PEARMAN, Penny Long Lane, Derby.

Class 439.—*Half-gallons of Honey Vinegar.* [4 entries, none absent.]

- 3119 I. (7s. 6d.)—C. LODGE, High Easter, Chelmsford.
3126 II. (5s.)—G. W. KIRBY, 10 Summerhill Road, St. George, Bristol.
3120 Certificate of Merit.—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.

Class 440.—*Half-gallons of Mead.* [6 entries, 1 absent.]

- 3124 I. (7s. 6d.)—H. W. SEYMOUR, 53 Market Place, Henley-on-Thames.
3128 II. (5s.)—ERNEST WALKER, Maybury Lodge, Woking.
3122 Certificate of Merit.—RICHARD ALLEN, Tusmore, Bicester.

Class 441.—*Exhibits of a practical or interesting nature connected with Bee-culture, not mentioned in the foregoing Classes.* [4 entries, 1 absent.]

- 3128 H. C.—RICHARD ALLEN, Tusmore, Bicester. A deep Frame of Comb, showing Worker, Drone, and Queen Cells.

Class 442.—*Exhibits of a scientific nature, not mentioned in the foregoing Classes, to which no prize has been awarded at a Show of the R.A.S.E.*

[No entry.]

BUTTER-MAKING COMPETITIONS.

Class 1.—*Dairymaids and Members of a Farmer's family.*
[22 entries, 5 absent.]

- 21 I. (£4.)—MISS ANNIE B. WALKER, The Farm, Icomb, Stow-on-the-Wold.
9 II. (£3.)—MISS JANE GARBUTT, Asylum Farm, Tooting, S.W.
6 III. (£2.)—MISS ELLA M. A. CROOK, Mentmore Dairy, Leighton Buzzard.
4 IV. (£1.)—MRS. N. COMER, Fanshaws Farm, Hertford.
11 R. N. & H. C.—MISS EMMA J. HOCKLEY, Cooper's Farm, Takcley, S.O.

Class 2.—*Persons actually under instruction, or who have been so during 1903 or 1904, at a recognised Dairy School.* [14 entries, none absent.]

- 34 I. (£4.)—MISS ELIZABETH W. STUBBS, Highfields, Stafford.
29 II. (£3.)—MISS ANNIE GERRARD, Huddington, Droitwich.
24 III. (£2.)—MISS MARY DALRYMPLE, Elliston, St. Boswells, N.B.
30 IV. (£1.)—MISS MARY LEIGHTON, Griff House, Nuneaton.
36 R. N. & H. C.—W. D. VALLANCE, Midland Dairy Institute, Kingston, Derby.

Class 3.—*Open to all comers.* [31 entries, 4 absent.]

- 45 I. (£4.)—MISS EDITH M. DAWSON, Park Farm, Osmaston, Ashbourne.
66 II. (£3.)—MISS ANNIE B. WALKER, The Farm, Icomb, Stow-on-the-Wold.
51 III. (£2.)—MISS ANNIE GERRARD, Huddington, Droitwich.
43 IV. (£1.)—MISS ELLA M. A. CROOK, Mentmore Dairy, Leighton Buzzard.
62 R. N. & H. C.—MISS ELIZABETH W. STUBBS, Highfields, Stafford.

Class 4.—*Winners in Classes 1, 2, and 3.* [9 Competitors.]

- 45 I. (£5, & Silver Medal.)—MISS EDITH M. DAWSON.
29 R. N. & H. C.—MISS ANNIE GERRARD.

HORSE-SHOEING COMPETITIONS.

Class 1.—Hunters. [45 entries, none absent.]

- 5 I. (£5.)—JOHN ALAN BENNETT, R.S.S., Whittlebury, Towcester.
- 14 II. (£4.)—DANIEL CRAWLEY, R.S.S., Percy Row, Petworth.
- 37 III. (£3.)—W. H. STANBURY, R.S.S., 36 Brownlow Street, East Stonehouse.
- 39 IV. (£2.)—WILLIAM STEWARD, R.S.S., Rockingham Lane, Sheffield.
- 17 V. (£1.)—CHARLES DOUBLE, R.S.S., Holmleigh, Spencers Wood, Reading.
- 10 VI. (£1.)—WILLIAM JOSEPH BROWN, R.S.S., Chapel Brampton.
- 33 R. N. & H. C.—W. J. RUDGE, R.S.S., The Tunnel, Queen Street, Cardiff.

Class 2.—Cart Horses. [51 entries, none absent.]

- 70 I. (£5.)—GRIFFITH JENKINS, Brynawel Bryn Road, Lampeter.
- 78 II. (£4.)—THOMAS B. LEWIS, R.S.S., Cambrian Forge, Aberystwyth.
- 86 III. (£3.)—JOHN REES, R.S.S., 10 Chapel Bridge, Cwmearn, Newport, Mon.
- 94 IV. (£2.)—JOHN LEWIS WATKINS, R.S.S., Llowes, Hay.
- 91 V. (£1.)—SAMUEL THOMPSON, R.S.S., Cumberland Street, Luton.
- 57 VI. (£1.)—GEORGE GASCOIGNE, Moreton Pinkney, Byfield.
- 71 R. N. & H. C.—DAVID JONES, R.S.S., 27 Herbert Street, Treorchy.

HORSE-JUMPING COMPETITIONS.

(The Entry Fees received were divided equally among the Prize-winners in each Class, in augmentation of the prizes.)

Class A.—Mares or Geldings, 15 hands 2 inches and over.

[20 entries, none absent.]

- 1 I. (£20.)—WHITTINGHAM BROS., 115 Byrkley Street, Burton-on-Trent, for **Starlight**, bay gelding.
- 11 II. (£15.)—GEORGE LEDSON, Manor House, Bromborough, for **Pioneer**, bay gelding.
- 4 III. (£10.)—F. VOLLER GRANGE, Oak House, Farndon, for **Hardcash**, black gelding.
- 20 R. N. & H. C.—F. W. FOSTER, Culland, Brailsford, Derby, for **Paddy**.

Class B.—Mares or Geldings, above 14 hands 2 inches and under 15 hands 2 inches.

[13 entries, 3 absent.]

- 10 I. (£20.)—GLENCROSS BROS., Garth House, Frome, for **Blink Bonny**, bay mare.
- 5 II. (£15.)—WALTER W. GRUNDY, 30 Broad Street, Worcester, for **Swallow**, black gelding.
- 12 III. (£10.)—F. VOLLER GRANGE, Oak House, Farndon, for **Rufus**, chestnut gelding.
- 6 R. N. & H. C.—BENJAMIN ROBINS, Lynsters Farm, Rickmansworth, for **Sterling**.

Class C.—Pony Mares or Geldings, 14 hands 2 inches and under.

[8 entries, none absent.]

- 8 I. (£15.)—WHITTINGHAM BROS., 115 Byrkley Street, Burton-on-Trent, for **Snowdrop**, grey mare.
- 3 II. (£10.)—WALTER W. GRUNDY, 30 Broad Street, Worcester, for **Stratford Lass**, black mare.
- 1 III. (£5.)—RICHARD TUGWELL, Church Street, Tetbury, for **Dainty**, brown mare.
- 5 R. N. & H. C.—HARRY RICH, Wembley, Middlesex, for **Wembley Kate**.

Class D.—Pony Mares or Geldings, 14 hands 2 inches and under, that have not won a Prize in a Jumping Competition prior to 1904. [1 entry.]

- 9 I. (£10.)—F. VOLLER GRANGE, Oak House, Farndon, for **Rocket**, chestnut gelding.

Class E.—Unsuccessful Competitors in Classes A and B.

[14 entries, none absent.]

- 12 I. (£10.)—A. NIXEY SMITH, Danchurst, Nutfield, Redhill, for **Grasshopper**, bay gelding.
- 5 II. (£5.)—A. NIXEY SMITH, for **Larky**.
- 9 III. (£3.)—A. NIXEY SMITH, for **Monarch**, bay gelding.
- 3 R. N. & H. C.—JOHN COLEMAN, M.R.C.V.S., The Farm, Epsom, for **Harlequin**.

Class F.—Unsuccessful Competitors in Classes C. and D. [3 entries.]

- 16 I. (£10.)—GLENCROSS BROS., Garth House, Frome, for **Bampton**, bay gelding.
- 17 II. (£5.)—HARRY RICH, Wembley, for **Wembley Kate**, dark chestnut mare.
- 15 III. (£2.)—E. J. & F. W. DANIELL, Church Farm, Atworth, Melksham, for **Laddie**, bay gelding.

POLO PONY COMPETITIONS.

Class A.—*Bending Competitions for Novices, for Ponies not less than 14 hands, and not exceeding 14 hands 2 inches, that have not won a prize in a Bending Competition prior to 1904.*

1 I. (£10.)—JOHN BARKER, The Grange, Bishops Stortford. for **Serf Bell**.

Class B.—*Handiest Pony Competitions, for Ponies not exceeding 14 hands 2 inches.*

2 I. (£10.)—HARRY RICH, Wembley, for **Killarney**.

1 II. (£5.)—JOHN BARKER, The Grange, Bishops Stortford, for **Serf Bell**.

Class C.—*Bending Competitions, for Ponies not less than 14 hands and not exceeding 14 hands 2 inches.*

3 I. (£10.)—H. & F. RICH, Wembley, for **Killarney**.

IMPLEMENTS.

Silver Medals

For Articles entered as "New Implements for Agricultural or Estate Purposes."

No. in
Implement
Catalogue.

- 100 BLACKSTONE & CO., LTD., Rutland Works, Stamford: for Direct Acting Centrifugal Governor for Oil Engine.
- 275 H. R. MARSDEN, Soho Foundry, Leeds: for Elevator for Stone-breaker.
- 338 IVEL AGRICULTURAL MOTORS, LTD., 45 Great Marlborough Street, London, W.: for Agricultural Motor, 20 H.P., 2 speeds.
- 496 H. J. WEST & CO., LTD., 118 Southwark Bridge Road, London, S.E.: for Refrigerating Machine.
- 762 RANSOMES, SIMS, & JEFFERIES, LTD., The Orwell Works, Ipswich: for Motor Lawn Mower.
- 3092 AKTIEBOLAGET PUMP SEPARATOR, Kt. S. Kyrkogata 13A, Stockholm, Sweden: for Hand Cream Separator.
- 4351 JAMES R. HATMAKER, 28 Boulevard Malesherbes, Paris: for Milk-Drying Machine.

PRIZE LIST

FOR

SHOW at PARK ROYAL, JUNE 27 to 30, 1905.

Total value of Prizes offered (inclusive of Champion Prizes, Cups, Medals, and Class Prizes), 7,850*l.*, of which amount 1,304*l.* are contributed by Breed Societies.

CHAMPION PRIZES.

The following Champion Prizes are offered by Breed Societies:—

HORSES.

HUNTERS' IMPROVEMENT SOCIETY:—Two Gold Medals, value 10*l.* 10*s.* each, for the best Hunter Mare 4 years and upwards, and for the best Filly not exceeding 3 years old.

HACKNEY HORSE SOCIETY:—Two Gold Medals, value 10*l.* each, for the best Hackney Stallion, and for the best Mare or Filly.

SHETLAND PONY STUD BOOK SOCIETY:—Silver Medal for the best Shetland Pony. POLO AND RIDING PONY SOCIETY:—Two Gold Medals for the best Polo and Riding Pony Stallion, and for the best Mare.

HACKNEY HORSE SOCIETY:—Gold Medal for the best Mare or Gelding in the Single Driving Classes, the produce of a Registered Hackney Stallion.

SHIRE HORSE SOCIETY:—Two Gold Medals for the best Shire Stallion, and for the best Mare or Filly, and 5*l.* each to the Breeders of the Champion Shire Stallion, and Mare or Filly.

CLYDESDALE HORSE SOCIETY:—Two Prizes of 10*l.* each for the best Clydesdale Stallion, and for the best Mare or Filly.

SUFFOLK HORSE SOCIETY:—Challenge Cup, value fifty guineas, for the best Suffolk Stallion, the Cup to become the absolute property of an Exhibitor winning it three times.

CATTLE.

SHORTHORN SOCIETY:—Two Prizes of 50*l.* each for the best Shorthorn Bull, and for the best Cow or Heifer; and 5*l.* each to the Breeders of the First Prize animals in the Inspection Classes for Shorthorns.

HEREFORD HERD-BOOK SOCIETY:—Two Prizes of 10*l.* 10*s.* each for the best Hereford Bull, and for the best Cow or Heifer.

DEVON CATTLE BREEDERS' SOCIETY:—Two Prizes of 10*l.* 10*s.* each for the best Devon Bull, and for the best Cow or Heifer.

POLLED CATTLE SOCIETY:—A Gold Medal for the best breeding animal of the Aberdeen Angus breed.

ENGLISH ABERDEEN ANGUS CATTLE ASSOCIATION.—A Gold Medal for the best animal of the opposite sex to that of the animal awarded the Gold Medal of the Polled Cattle Society.

GALLOWAY CATTLE SOCIETY:—Prize of 10*l.* 10*s.* for the best Galloway Animal.

ROYAL JERSEY AGRICULTURAL SOCIETY:—A Special Prize of 10*l.* 10*s.* for the best Jersey Bull.

ENGLISH KERRY AND DEXTER CATTLE SOCIETY:—Two Challenge Cups, value 26*l.* 5*s.* each, for the best Kerry Bull, Cow, or Heifer, and for the best Dexter Bull, Cow, or Heifer, each Cup to become the property of an Exhibitor winning it three years in succession.

ENGLISH JERSEY CATTLE SOCIETY:—Gold Medal (or 10*l.* in money), Silver Medal and Bronze Medal for the three best Jersey Animals in the Butter Test Classes.

SHEEP.

SOUTHDOWN SHEEP SOCIETY:—A Gold Medal (or 10*l.* 10*s.* in money) for the best Southdown Ram; and Silver Medal for the best Pen of Ewes or Ewe Lambs.

HAMPSHIRE DOWN SHEEP BREEDERS' ASSOCIATION:—Prize of 10*l.* for the best Pen of Hampshire Down Ram Lambs, or Ewe Lambs.

LINCOLN LONG-WOOL SHEEP BREEDERS' ASSOCIATION:—A Champion Medal (or 5*l.* in money) for the best Lincoln Ram.

DORSET HORN SHEEP BREEDERS' ASSOCIATION:—Prize of 10*l.* for the best Pen of Ram Lambs, Shearling Ewes, or Ewe Lambs.

PIGS.

NATIONAL PIG BREEDERS' ASSOCIATION:—Three Gold Medals, or 5*l.* 5*s.* in money, for the best Large White Boar or Sow, Middle White Boar or Sow, and Tamworth Boar or Sow.

BRITISH BERKSHIRE SOCIETY:—Prize of 5*l.* for the best Berkshire Boar or Sow.

LARGE BLACK PIG SOCIETY:—Prize of 10*l.* for the best Large Black Boar.

HORSES (£2,056).

	Prizes		
	1st	2nd	3rd
HUNTERS.			
MARE, with foal at foot (13 st. and upwards)	15	10	5
FILLY, foaled in 1902	15	10	5
FILLY, foaled in 1903	15	10	5
FILLY, foaled in 1904	15	10	5
MARE OR GELDING (14 st. and upwards), foaled in or before 1901	20	10	5
MARE OR GELDING (under 14 st.), foaled in or before 1901	20	10	5

CLEVELAND BAYS.

STALLION, foaled in 1902 or 1903	15	10	5
MARE (with foal at foot)	15	10	5
FILLY, foaled in 1902 or 1903	15	10	5

COACH HORSES.

STALLION, foaled in 1902 or 1903	15	10	5
MARE (with foal at foot)	15	10	5
FILLY, foaled in 1902 or 1903	15	10	5

HACKNEYS.

STALLION, foaled in 1902, 15 h. 1 in. and upwards	15	10	5
STALLION, foaled in 1903	15	10	5
STALLION, foaled in 1904	15	10	5
MARE (with foal at foot), 15 h. and upwards	15	10	5
FILLY, foaled in 1902	15	10	5
FILLY, foaled in 1903	15	10	5

PONIES.

STALLION, over 12 h. 2 in. and not over 14 h.	15	10	5
STALLION, not over 12 h. 2 in.	10	6	4
MARE (with foal at foot), over 12 h. 2 in. and not over 14 h.	15	10	5
MARE (with foal at foot), not over 12 h. 2 in.	10	6	4
MARE, foaled in 1902 or 1903, not over 14 h.	15	10	5

SHETLAND PONIES.

STALLION, foaled before or in 1902, not over 10½ h.	15	10	5
MARE, foaled before or in 1901, not over 10½ h.	15	10	5
FILLY, foaled in 1902 or 1903	15	10	5

MOUNTAIN AND MOORLAND PONIES.

STALLION, foaled before or in 1901, not over 13 h.	15	10	5
MARE, foaled before or in 1901, not over 13 h.	15	10	5

POLO AND RIDING PONIES.

STALLION, not over 14 h. 2 in.	15	10	5
MARE, above 13 h. 2 in. and not over 14 h. 2 in., with foal at foot, or to foal in 1905	15	10	5
MARE, not over 13 h. 2 in., with foal at foot, or to foal in 1905	15	10	5
GELDING OR FILLY foaled in 1902, not over 14 h. 1½ in.¹	7	5	3
COLT, GELDING, OR FILLY, foaled in 1903, not above 14 h. 0½ in.¹	7	5	3
COLT, GELDING, OR FILLY, foaled in 1904¹	7	5	3

¹ Offered by the Polo and Riding Pony Society.

² Offered by the Shire Horse Society.

³ Offered by the Suffolk Horse Society.

⁴ Offered by the Shorthorn Society.

HARNESS HORSES AND PONIES.

To be driven in Harness.
One day classes.

Prizes
1st 2nd 3rd
£ £ £

MARE OR GELDING, any age, 15 h. 2 in. and upwards	15	10	5
MARE OR GELDING, any age, under 15 h. 2 in.	15	10	5
PONY MARE OR GELDING, any age, not over 14 h.	15	10	5
PAIR OF HORSES (Mares or Geldings), 15 h. 2 in. and upwards	15	10	5
PAIR OF HORSES (Mares or Geldings), under 15 h. 2 in.	15	10	5
TANDEM (Mares or Geldings), any height	15	10	5

FOUR-IN-HAND TEAMS.

MARES OR GELDINGS, to be shown in harness, with coach	15	10	5
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TROTTING HORSES.

MARE OR GELDING, bred in the United Kingdom, to be driven against time	10	5	3
MARE OR GELDING, to be driven against time	10	5	3

SHIRE.

STALLION, foaled in 1902	15	10	5
STALLION, foaled in 1903	15	10	5
STALLION, foaled in 1904	15	10	5
MARE (with foal at foot)	15	10	5
FILLY, foaled in 1902	15	10	5
FILLY, foaled in 1903	15	10	5
FILLY, foaled in 1904²	15	10	5
GELDING, foaled in 1899, 1900, or 1901	15	10	5

CLYDESDALE.

STALLION, foaled in 1902	15	10	5
STALLION, foaled in 1903	15	10	5
STALLION, foaled in 1904	15	10	5
MARE (with foal at foot)	15	10	5
FILLY, foaled in 1902	15	10	5
FILLY, foaled in 1903	15	10	5
GELDING, foaled in '99, '00, or '01	15	10	5

SUFFOLK.

STALLION, foaled in or before '01³	10	5	-
STALLION, foaled in 1902	15	10	5
STALLION, foaled in 1903	15	10	5
STALLION, foaled in 1904	15	10	5
MARE (with foal at foot)	15	10	5
FILLY, foaled in 1902	15	10	5
FILLY, foaled in 1903	15	10	5
GELDING, foaled in '99, '00, or '01	15	10	5

CATTLE (£2,942).

SHORTHORN.

BULL, calved in 1901 or 1902	15	10	5
BULL, calved in 1903	15	10	5
BULL, calved in 1904	15	10	5
COW, in-milk, calved before or in 1901	15	10	5
HEIFER, in-milk, calved in 1902⁴	15	10	5
HEIFER, calved in 1903	15	10	5
HEIFER, calved in 1904	15	10	5
DAIRY COW, in-milk, calved previously to or in 1900⁴	15	10	5
DAIRY COW, in-milk, calved in or after 1901⁴	15	10	5
Milk Yield Prizes	10	5	3

Prizes		
1st	2nd	3rd
£	£	£

LINCOLNSHIRE RED SHORT-HORN.

BULL, calved in 1901 or 1902	15	10	5
BULL, calved in 1903 ¹	10	6	4
BULL, calved in 1904 ¹	10	6	4
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903 ¹	10	6	4
HEIFER, calved in 1904 ¹	10	6	4
Milk Yield Prizes	10	5	3

HEREFORD.

BULL, calved in 1901 or 1902	15	10	5
BULL, calved in 1903	15	10	5
BULL, calved in 1904	15	10	5
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903	15	10	5
HEIFER, calved in 1904	15	10	5

DEVON.

Same as for Hereford.

SOUTH DEVON.

BULL, calved in 1901 or 1902	15	10	5
COW OR HEIFER, in-milk, calved before or in 1902	15	10	5
Milk Yield Prizes	10	5	3

SUSSEX.

Same as for Hereford.

WELSH.

BULL, calved in 1901, 1902, or 1903	15	10	5
BULL, calved in 1904	15	10	5
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903 or 1904	15	10	5

RED POLLED.

BULL, calved in 1901 or 1902	15	10	5
BULL, calved in 1903	15	10	5
BULL, calved in 1904	15	10	5
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903	15	10	5
HEIFER, calved in 1904	15	10	5
Milk Yield Prizes	10	5	3

ABERDEEN ANGUS.

Same as for Hereford.

GALLOWAY.

Same as for Welsh.

HIGHLAND.

BULL, calved in 1901 or 1902	15	10	5
COW OR HEIFER, in-milk, calved in or before 1902	15	10	5

AYRSHIRE.

BULL, calved in 1901, 1902, 1903, or 1904	15	10	5
COW OR HEIFER, in-milk, or in-calf, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903 or 1904 ²	10	6	4
Milk Yield Prizes	10	5	3

Prizes		
1st	2nd	3rd
£	£	£

JERSEY.

BULL, calved in 1901 or 1902	15	10	5
BULL, calved in 1903	15	10	5
BULL, calved in 1904	15	10	5
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, in-milk, calved in 1903	15	10	5
HEIFER, calved in 1904	15	10	5
Milk Yield Prizes	10	5	3

GUERNSEY.

BULL, calved in 1901 or 1902	10	6	4
BULL, calved in 1903	10	6	4
BULL, calved in 1904	10	6	4
COW OR HEIFER, in-milk, calved previously to or in 1902	10	6	4
HEIFER, calved in 1903	10	6	4
HEIFER, calved in 1904	10	6	4
Milk Yield Prizes	10	5	3

LONGHORN.

BULL, calved in 1901, 1902, or 1903	15	10	5
BULL, calved in 1904 ³	10	5	-
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903 or 1904 ³	10	5	-
Milk Yield Prizes	10	5	3

KERRY.

BULL, calved in 1901, 1902, or 1903	15	10	5
COW OR HEIFER, in-milk, calved previously to or in 1902	15	10	5
HEIFER, calved in 1903 or 1904 ⁴	5	3	2
Milk Yield Prizes	10	5	3

DEXTER.

Same as for Kerry.

BUTTER TESTS.⁵

Cow, of any age, breed, or cross, exceeding 900 lb. live weight	15	10	5
Cow, of any age, breed, or cross, not exceeding 900 lb. live weight	15	10	5
SPECIAL PRIZES for the 3 cows in above classes obtaining the greatest number of points in the competition	20	10	5

The Prizes in the Butter Tests will be awarded according to the following scale of points:—One point for every ounce of Butter; one point for every completed ten days since calving, deducting the first forty days. Maximum allowance for period of lactation, 12 points. Duration of Test, 24 hours.

Special Milk Yield Prizes for 3 best cows in Milk Yield Classes and Butter Test	20	10	5
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¹ Offered by the Lincolnshire Red Short-horn Association.² Offered by the Ayrshire Cattle Herd Book Society.³ Offered by the Longhorn Cattle Society.⁴ Offered by the English Kerry and Dexter Cattle Society.⁵ Offered by the English Jersey Cattle Society.

SHEEP (£1,643).

	Prizes			
	1st	2nd	3rd	4th
OXFORD DOWN.	£	£	£	£
SHEARLING RAM ¹ . . .	10	6	4	2
THREE RAM LAMBS, dropped in 1905 ¹ . . .	10	6	4	2
THREE SHEARLING EWES ¹ . . .	10	6	4	2
THREE EWE LAMBS, dropped in 1905 ¹ . . .	10	6	4	2

SHROPSHIRE.

TWO-SHEAR RAM ² . . .	8	4	-	-
SHEARLING RAM . . .	10	6	4	-
FIVE SHEARLING RAMS ² . . .	15	10	5	-
SELLING CLASS FOR SHEAR- LING RAMS ² . . .	20	15	10	5
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4	-
THREE SHEARLING EWES . . .	10	6	4	-
THREE EWE LAMBS, dropped in 1905 . . .	10	6	4	-

SOUTHDOWN.

	Prizes		
	1st	2nd	3rd
	£	£	£
TWO-SHEAR RAM ³ . . .	10	6	4
SHEARLING RAM . . .	10	6	4
THREE SHEARLING RAMS ³ . . .	10	6	4
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4
THREE EWE LAMBS, dropped in 1905 . . .	10	6	4

HAMPSHIRE DOWN.

TWO-SHEAR RAM ⁴ . . .	10	5	-
SHEARLING RAM . . .	10	6	4
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4
THREE EWE LAMBS, dropped in 1905 . . .	10	6	4

SUFFOLK.

TWO-SHEAR RAM ⁵ . . .	10	5	3
SHEARLING RAM . . .	10	6	4
RAM LAMB, dropped in 1905 ⁵ . . .	10	5	3
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4
THREE EWE LAMBS, dropped in 1905 . . .	10	6	4

LINCOLN.

TWO-SHEAR RAM ⁶ . . .	7	3	-
SHEARLING RAM . . .	10	6	4
FIVE SHEARLING RAMS ⁶ . . .	15	10	5
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4
THREE EWE LAMBS, dropped in 1905 . . .	10	6	4
THREE EWE HOGGETS, in wool ⁶ . . .	10	5	3

LEICESTER.

	Prizes		
	1st	2nd	3rd
	£	£	£
SHEARLING RAM . . .	10	6	4
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4
THREE EWE LAMBS, dropped in 1905 . . .	10	6	4

COTSWOLD.

Same as for Leicester.

BORDER LEICESTER.

Same as for Leicester.

KENT OR ROMNEY MARSH.

TWO-SHEAR RAM ⁷ . . .	10	6	4
SHEARLING RAM . . .	10	6	4
THREE RAM LAMBS, dropped in 1905 . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4
THREE EWE LAMBS, dropped in 1905 ⁷ . . .	10	6	4

WENSLEYDALE.

Same as for Leicester.

DORSET HORN.

SHEARLING RAM, dropped after Nov. 1, 1903 . . .	10	6	4
THREE RAM LAMBS, dropped after Nov. 1, 1904 . . .	10	6	4
THREE SHEARLING EWES, dropped after Nov. 1, 1903 . . .	10	6	4
THREE EWE LAMBS, dropped after Nov. 1, 1904 . . .	10	6	4

DEVON LONG-WOOL.

RAM, SHEARLING and upwards	10	6	4
THREE SHEARLING EWES . . .	10	6	4

DARTMOOR.

Same as for Devon Long-Wool.

EXMOOR.

Same as for Devon Long-Wool.

CHEVIOT.

Same as for Devon Long-Wool.

BLACK-FACED MOUNTAIN.

Same as for Devon Long-Wool.

LONK.

Same as for Devon Long-Wool.

HERDWICK.

Same as for Devon Long-Wool.

WELSH MOUNTAIN.

Same as for Devon Long-Wool.

RYELAND.

RAM, TWO-SHEAR and up- wards ⁸ . . .	10	5	3
SHEARLING RAM . . .	10	6	4
THREE SHEARLING EWES . . .	10	6	4

¹ Offered by the Oxford Down Sheep Breeders' Association.² Offered by the Shropshire Sheep Breeders' Association.³ Offered by the Southdown Sheep Society.⁴ Offered by the Hampshire Down Sheep Breeders' Association.⁵ Offered by the Suffolk Sheep Society.⁶ Offered by the Lincoln Long-Wool Sheep Breeders' Association.⁷ Offered by the Kent or Romney Marsh Sheep Breeders' Association.⁸ Offered by the Ryeland Sheep Breeders' Association.

PIGS (£471).

Large White	} For Prizes see below.
Middle White	
Berkshire	
Tamworth	

In each of the above Breeds the following prizes will be given:—

	1st £	2nd £	3rd £
BOAR, farrowed in 1903 or 1904	10	6	4
THREE BOAR PIGS, farrowed in 1905	10	6	4
BREEDING SOW, farrowed in 1901, 1902, 1903, or 1904	10	6	4
THREE SOW PIGS, farrowed in 1905	10	6	4

SMALL WHITE.

BOAR, farrowed in 1903 or 1904	10	6	4
BREEDING SOW, farrowed in 1901, 1902, 1903, or 1904	10	6	4

LARGE BLACK.

BOAR, farrowed in 1903 or 1904	10	6	4
BOAR PIG, farrowed in 1905	10	6	4
BREEDING SOW, farrowed in 1901, 1902, 1903, or 1904	10	6	4
THREE SOW PIGS, farrowed in 1905	10	6	4

POULTRY (£324).

Prizes are offered for the best COCK, HEN, COCKEREL, and PULLET of the following Breeds:—

	s.	s.	s.
Game, Old English	30	15	10
Game, Indian	30	15	10
Dorking, Coloured	30	15	10
Dorking, Silver Grey	30	15	10
Dorking, White or other variety	30	15	10
Sussex, Red or Brown	30	15	10
Sussex, Light	30	15	10
Sussex, Speckled	30	15	10
Brahma and Cochin	30	15	10
Langshan	30	15	10
Plymouth Rock	30	15	10
Wyandotte, Silver	30	15	10
Wyandotte, Gold	30	15	10
Wyandotte, other variety	30	15	10
Orpington, Buff	30	15	10
Orpington, other variety	30	15	10
French, Faverolle	30	15	10
French, other variety	30	15	10
Minorca	30	15	10
Leghorn, White	30	15	10
Leghorn, Brown	30	15	10
Leghorn, other colour	30	15	10
Ancona	30	15	10
Andalusian	30	15	10
Any other breeds (except Bantams)	30	15	10

TABLE FOWLS

(To be sent and exhibited alive).

PAIR of COCKERELS, pure-breed	30	15	10
PAIR of PULLETS, pure-breed	30	15	10
PAIR of CROSS-BRED COCKERELS	30	15	10
PAIR of CROSS-BRED PULLETS	30	15	10

DUCKS, &c.

	Prizes		
	1st s.	2nd s.	3rd s.
Aylesbury Drake	30	15	10
Aylesbury Duck	30	15	10
Aylesbury Young Drake	30	15	10
Aylesbury Duckling	30	15	10
Rouen Drake	30	15	10
Rouen Duck	30	15	10
Pekin Drake	30	15	10
Pekin Duck	30	15	10
Cayuga Drake	30	15	10
Cayuga Duck	30	15	10
Indian Runner Drake	30	15	10
Indian Runner Duck	30	15	10
Any breed (except Aylesbury) or cross-bred Pair of Ducklings	30	15	10
Gander, Embden	40	20	10
Goose, Embden	40	20	10
Gander, Toulouse	40	20	10
Goose, Toulouse	40	20	10
Turkey, Cock	40	20	10
Turkey, Hen	40	20	10

NEW LAID HENS' EGGS.

Shown in Cases of five dozen.

White Shell	30	15	10
Brown or Tinted Shell	30	15	10

BREEDING PENS.

Consisting of One COCK or COCKEREL, and Four HENS or PULLETS, or One DRAKE and Four DUCKS.

Indian Game, any variety	40	20	10
Dorking, any variety	40	20	10
Plymouth Rock or Wyandotte, any variety	40	20	10
Orpington, any variety	40	20	10
Minorca or Leghorn, any variety	40	20	10
Any other variety	40	20	10
White Ducks, any variety	40	20	10
Coloured Ducks, any variety	40	20	10

PRODUCE (£260).

BUTTER.

Keg or other Package of BUTTER not less than 14 lb. and under 40 lb. in weight. 1st 4l., 2nd 2l.

Box of Twelve 2 lb. Rolls of BUTTER, not more than 1 per cent. salt. 1st 4l., 2nd 2l., 3rd 1l.

2 pounds of FRESH BUTTER, slightly salted, made up in pounds. } Four of 2l. each.
Four of 1l. each.
Four of 10/- each.

2 pounds of FRESH BUTTER, slightly salted, made up in pounds, from milk drawn from Cows other than Channel Islands, or Cows crossed with Channel Islands breeds. } Four of 2l. each.
Four of 1l. each.
Four of 10/- each.

CHEESE.

(Made in 1905.)

	Prizes			
	1st £	2nd £	3rd £	4th £
THREE CHEDDAR, of not less than 50 lb. each	8	5	3	1
THREE CHESHIRE, of not less than 40 lb. each	8	5	3	1
THREE STILTON	5	3	2	-
THREE WENSLEYDALE, (Stilton Shape)	5	3	2	-

	Prizes			
	1st	2nd	3rd	4th
	£	£	£	£
CHEESE (<i>continued</i>).				
THREE DOUBLE GLOUCESTER	5	3	2	-
THREE WILTSHIRE (Loaf or Flat), not over 16 lb. each	5	3	2	-
THREE CHEDDAR TRUCKLE CHEESES	3	2	1	-

	Prizes			
	1st	2nd	3rd	4th
	£	£	£	£
CIDER AND PERRY.				
Cask of CIDER, made 1904	5	3	2	
ONE DOZ. CIDER, made 1904	5	3	2	
ONE DOZ. CIDER, made before 1904	5	3	2	
ONE DOZ. PERRY	5	3	2	

WOOL (<i>of 1905 Clip</i>).				
3 Fleeces in each Entry.				
Leicester or Border Leicester	3	2	1	
Lincoln	3	2	1	
Kent or Romney Marsh	3	2	1	
Any other Long Wool	3	2	1	
Southdown	3	2	1	
Shropshire	3	2	1	
Any other Short Wool	3	2	1	
Welsh	3	2	1	
Scotch	3	2	1	

HIVES, HONEY, AND BEE APPLIANCES.

	Offered by British Bee-keepers' Association.		
	s.	s.	s.
Collection of HIVES	80	40	20
FRAME HIVE	20	15	10
Do. for Cottagers' use	20	15	10
HONEY EXTRACTOR	15	10	-
OBSERVATORY HIVE (not more than 3 frames)	20	15	10
USEFUL APPLIANCES	10	-	-

For the purposes of Classes for Honey the United Kingdom has been divided into Two Districts:—

1. Counties of Leicester, Monmouth, Worcester, Hereford, Warwick, Salop, Notts, Lincoln, Rutland, Chester, Derby, Stafford, Yorks, Lancs, Northumberland, Durham, Cumberland, Westmorland, 1. of Man, Scotland, Ireland, or Wales.
2. Counties of Cornwall, Devon, Somerset, Dorset, Wilts, Berks, Hants, 1. of Wight, Surrey, Sussex, Kent, Suffolk, Essex, Bucks, Middlesex, Herts, Oxon, Norfolk, Cambridge, Hunts, Bedford, Gloucester, or Northampton.

HONEY, &c. (*continued*).

For each of the above Districts the following four Classes and Prizes, for Honey of any year, have been provided:—

	Prizes		
	1st	2nd	3rd
	s.	s.	s.
HONEY.			
12 Sections of COMB HONEY, about 12lb.	20	15	10
RUN OR EXTRACTED, LIGHT-COLOURED HONEY, about 12lb.	20	15	10
RUN OR EXTRACTED, MEDIUM OR DARK-COLOURED HONEY, about 12lb.	20	15	10
GRANULATED HONEY, about 12lb.	20	15	10

MISCELLANEOUS.

3 Shallow frames of COMB HONEY, for extracting	20	15	10
6 Jars of HEATHER HONEY, about 6 lb.	20	15	10
DISPLAY OF HONEY	30	20	10
2lb. of WAX	10	7	5
3lb. of WAX, in marketable form, suitable for retail trade	10	7	5
HONEY VINEGAR, $\frac{1}{2}$ gallon	7	6	5
MEAD, $\frac{1}{2}$ gallon	7	6	5
OTHER PRACTICAL EXHIBITS	10	-	-
OTHER SCIENTIFIC EXHIBITS	10	-	-

HORSE-JUMPING COMPETITIONS (£138).

	1st	2nd	3rd
	£	£	£
CLASS A.—Mares or Geldings, 15 hands 2 inches and over	20	15	10
CLASS B.—Mares or Geldings, above 14 hands 2 inches and under 15 hands 2 inches	20	15	10
CLASS C.—Pony Mares or Geldings, 14 hands 2 inches and under	15	10	5
CLASS D.—Consolation Class for animals which have not won a Prize in Classes A and B	10	5	3

HORSE-SHOEING COMPETITION (£16).

PRIZES amounting to 16l. are offered in one class for the shoeing of Light Horses The Competition will commence on Wednesday, June 28, 1905.

PRINCIPAL ADDITIONS TO THE LIBRARY, 1904.

[*The name of the donor, or the mode of acquisition, appears in Italics after the title of each work.*]

- AGRICULTURAL Almanack and Diary, 1905. Edited by C. Adeane and Richardson Carr. 4to. London, 1904 *Editors*
 Agricultural Chronicle Diary, 1905. 4to. London, 1905..... *Publishers*
 BROOMHALL, G. J. S., The Corn Trade Year Book. 8vo. Liverpool, 1904..... *Author*
 Brown, Edward, F.L.S., Poultry Keeping as an Industry for Farmers and Cottagers. 5th. ed., revised and enlarged. 4to. London, 1904 *Author*
 DISEASES of the Horse. Special Report on. Various Authors. Revised Edition. 8vo. Washington, 1903 *U.S. Dept. of Agriculture*
 ENQUÊTE sur l'Industrie Laitière. Tome 1^{ier}. France-Etranger. Large 8vo. Paris, 1903 *Ministère de l'Agriculture*

Flock-Books :—

- Hampshire Down. Vol. XV. 8vo. Salisbury, 1904 *Assocn.*
 Kent or Romney Marsh. Vol. X. 8vo. London, 1904..... *Assocn.*
 Leicester. Vol. XII. 8vo. Hull, 1904 *Assocn.*
 Lincoln Long-wool. Vol. XIII. 8vo. Lincoln, 1904 *Assocn.*
 Oxford Down. Vol. XVI. 8vo. Oxford, 1904 *Assocn.*
 Shropshire. Vol. XXII. 8vo. Shrewsbury, 1904 *Assocn.*
 Suffolk. Vol. XVIII. 8vo. Bury St. Edmunds, 1904 *Society*
 Wensleydale Blue Faced. Vol. XV. 8vo. Hawes, 1904 *Assocn.*
 Wensleydale Long-wool. Vol. XV. 8vo. Hawes, 1904 *Assocn.*
 GORDON George, V.M.H. The Book of Shrubs. 8vo. London and New York, 1903 *Publisher*

Herd-Books :—

- Ayrshire. Vol. XXVII. 8vo. Kilmarnock, 1904 *Society*
 Coates's. Vol. L. 8vo. London, 1904 *Shorthorn Society*
 Davy's Devon. Vol. XXVII. 8vo. Exeter, 1904 *Society*
 English Jersey. Vol. XV. 8vo. London, 1904 *Society*
 Galloway. Vol. XXIV. 8vo. Dumfries, 1904 *Society*
 Hereford. Vol. XXXV. 8vo. Hereford, 1904 *Society*
 Kerry and Dexter. Vol. XI. 8vo. Dublin, 1903 ... *Royal Dublin Society*
 British Berkshire Pig. Vol. XX. 8vo. Abingdon, 1904 *Society*
 Large Black Pig. Vol. IV. 8vo. Bury St. Edmunds, 1902 *Society*
 National Pig. Vol. XX. 8vo. Nottingham, 1904..... *Assocn.*
 Polled (Aberdeen Angus). Vol. XXVIII. 8vo. Banff, 1904 *Society*

IRISH Agricultural Organisation Society, Limited, Report of the, for the eighteen months ending June 30, 1904. 8vo. Dublin, 1904..... *Society*

KEEN, F. N. Markets, Fairs, and Slaughter Houses. 8vo. Westminster, 1904
Publishers

Koch A. Handwörterbuch der Gesammten Thierheil-Kunde und Thierzucht. Bd. II. 8vo. Vienna and Leipzig, 1903 *Purchased*

LÉOUZON, Louis. Agronomes et Eleveurs. 8vo. Paris, 1905 *Author*

MILL, H. R., D.Sc., LL.D., F.R.S.E. British Rainfall, 1903. 8vo. London, 1904 *Author*

Parliamentary Papers :—

- Admiralty. Report and Minutes of Evidence of Committee on the Humane Slaughtering of Animals. Folio. London, 1904 *Purchased*
 Board of Agriculture and Fisheries. Agricultural Returns, 1903. 8vo. London, 1904 *Board*

- Board of Agriculture and Fisheries. Annual Report on Distribution of Grants for Agricultural Education and Research, 1903-1904. 8vo. London, 1904 *Board*
- Annual Report under the Diseases of Animals Acts, 1903. 8vo. London. 1904 *Board*
- Report and Minutes of Evidence of the Departmental Committee on the Dipping and Treatment of Sheep. Folio. London, 1904..... *Purchased*
- Board of Trade. Annual Statement of Trade, 1904. Vols. I., II. Folio. London, 1904 *Board*
- Statistical Abstract for the United Kingdom, 1904. 8vo. London, 1904. *Board*
- Statistical Abstracts for Colonial and other Possessions and for Foreign Countries, 1903. 8vo. London, 1904 *Board*
- Department of Agriculture and Technical Instruction for Ireland. Third Annual General Report of the Department, 1902-1903. 8vo. Dublin 1904..... *Dept.*
- Agricultural Statistics of Ireland, 1903. 8vo. Dublin, 1904 *Dept.*
- Irish Migratory Labourers, 1904. 8vo. Dublin, 1904 *Dept.*
- Royal Commission on Tuberculosis (Human and Bovine). Interim Report. Folio. London, 1904 *Purchased*
- Report and Special Report on the Tuberculosis (Animals) Compensation Bill. Folio. London, 1904 *Purchased*
- Reports from the Government and from H.M. Representatives abroad or Legislative Measures respecting Gambling in "Option" and "Future" Contracts as regards Food Stuffs. Folio. London, 1904 *Purchased*
- RENDLE, A. B., M.A., D.Sc., F.L.S. The Classification of Flowering Plants. Vol. I. Gymnosperms and Monocotyledons. 8vo. Cambridge, 1904. *Cambridge University Press*
- Report of the Conference on Agricultural Education, held at Gloucester, October 15, 1904. 8vo. Gloucester, 1904. *Gloucestershire Education Committee*
- Robinson, W. Flora and Sylva. Vol. I. 4to. London, 1903..... *Author*
- SMITH, C. W. Free Trade and Protection under the International "Bear" Operator, 1874-1904. 8vo. Westminster, 1904 *Publishers*
- Stud-Books:—*
- Clydesdale. Vol. XXVI. 8vo. Glasgow, 1904 *Society*
- Hackney. Vol. XXI. 8vo. London, 1904 *Society*
- Polo and Riding Pony. Vol. VIII. 8vo. Lewes, 1905 *Society*
- Shetland Pony. Vol. XIV. 8vo. Aberdeen, 1904..... *Society*
- Shire. Vol. XXV. 8vo. London, 1904 *Society*
- THEOBALD, F. V., M.A., Second Report on Economic Zoology. 8vo. London, 1904 *Trustees of British Museum*

The Society is indebted to numerous Government Departments, both at home and abroad, to Boards of Agriculture, Agricultural Societies, and kindred institutions, for copies of their Annual Reports, Journals, Proceedings, Transactions, Bulletins, and other documents received regularly for the Library in exchange for copies of the Journal, as well as to the Editors of many agricultural and general papers for the current numbers of their publications, which have been placed for reference in the Reading Room.

TABLE SHOWING THE NUMBER OF GOVERNORS AND MEMBERS
IN EACH YEAR FROM THE ESTABLISHMENT OF THE SOCIETY.

Year ending with Show of	President of the Year	Governors		Members			Total
		Life	Annual	Life	Annual	Honor- ary	
1839	3rd Earl Spencer	—	—	—	—	—	1,100
1840	5th Duke of Richmond	86	189	146	2,434	5	2,860
1841	Mr. Philip Pusey	91	219	231	4,047	7	4,595
1842	Mr. Henry Handley	101	211	328	5,194	15	5,849
1843	4th Earl of Hardwicke	94	209	429	6,155	15	6,902
1844	3rd Earl Spencer	95	214	442	6,161	15	6,927
1845	5th Duke of Richmond	94	198	527	5,899	15	6,733
1846	1st Viscount Portman	92	201	554	6,105	19	6,971
1847	6th Earl of Egmont	91	195	607	5,478	20	6,391
1848	2nd Earl of Yarborough	93	186	648	5,387	21	6,335
1849	3rd Earl of Chichester	89	178	582	4,643	20	5,512
1850	4th Marquis of Downshire	90	169	627	4,356	19	5,261
1851	5th Duke of Richmond	91	162	674	4,175	19	5,121
1852	2nd Earl of Ducie	93	156	711	4,002	19	4,981
1853	2nd Lord Ashburton	90	147	739	3,928	19	4,923
1854	Mr. Philip Pusey	88	146	771	4,152	20	5,177
1855	Mr. William Miles, M.P.	89	141	795	3,838	19	4,882
1856	1st Viscount Portman	85	139	839	3,896	20	4,979
1857	Viscount Ossington	83	137	896	3,933	19	5,068
1858	6th Lord Berners	81	133	904	4,010	18	5,146
1859	7th Duke of Marlborough	78	130	927	4,008	18	5,161
1860	5th Lord Walsingham	72	119	927	4,047	18	5,183
1861	4th Earl of Powis	84	90	1,113	3,328	18	4,633
1862	{ H.R.H. The Prince Consort 1st Viscount Portman }	83	97	1,151	3,475	17	4,823
1863	Viscount Eversley	80	88	1,263	3,735	17	5,183
1864	2nd Lord Feversham	78	45	1,343	4,013	17	5,496
1865	Sir E. C. Kerrison, Bart., M.P.	79	81	1,386	4,190	16	5,752
1866	1st Lord Tredegar	79	84	1,395	4,049	15	5,622
1867	Mr. H. S. Thompson	77	82	1,388	3,903	15	5,465
1868	6th Duke of Richmond	75	74	1,409	3,888	15	5,461
1869	H.R.H. The Prince of Wales, K.G.	75	73	1,417	3,864	17	5,446
1870	7th Duke of Devonshire	74	74	1,511	3,764	15	5,438
1871	6th Lord Vernon	72	74	1,589	3,896	17	5,648
1872	Sir W. W. Wynn, Bart., M.P.	71	73	1,655	3,953	14	5,766
1873	Earl Cathcart	74	62	1,832	3,936	12	5,916
1874	Mr. Edward Holland	76	58	1,944	3,756	12	5,846
1875	Viscount Bridport	79	79	2,058	3,918	11	6,145
1876	2nd Lord Chesham	83	78	2,164	4,013	11	6,349
1877	Lord Skelmersdale	81	76	2,239	4,073	17	6,486
1878	Col. Kingscote, C.B., M.P.	81	72	2,328	4,130	26	6,637
1879	H.R.H. The Prince of Wales, K.G.	81	72	2,453	4,700	26	7,332
1880	9th Duke of Bedford	83	70	2,673	5,083	20	7,929
1881	Mr. William Wells	85	69	2,765	5,041	19	7,979
1882	Mr. John Dent Dent	82	71	2,849	5,059	19	8,080
1883	6th Duke of Richmond and Gordon	78	71	2,979	4,952	19	8,099
1884	Sir Brandreth Gibbs	72	72	3,203	5,408	21	8,776
1885	Sir M. Lopes, Bart., M.P.	71	69	3,356	5,619	20	9,135
1886	H.R.H. The Prince of Wales, K.G.	70	61	3,414	5,569	20	9,134
1887	Lord Egerton of Tatton	71	64	3,440	5,387	20	8,982
1888	Sir M. W. Ridley, Bart., M.P.	66	56	3,521	5,225	16	8,884
1889	HER MAJESTY QUEEN VICTORIA	73	58	3,567	7,153	15	10,866
1890	Lord Moreton	122	58	3,846	6,941	17	10,984
1891	2nd Earl of Ravensworth	117	60	3,811	6,921	19	10,928
1892	Earl of Feversham	111	69	3,784	7,066	20	11,050
1893	1st Duke of Westminster, K.G.	107	74	3,786	7,138	21	11,126
1894	Duke of Devonshire, K.G.	113	73	3,798	7,212	22	11,218
1895	Sir J. H. Thorold, Bart.	120	80	3,747	7,179	23	11,149
1896	Sir Walter Gilbey, Bart.	126	83	3,695	7,253	23	11,180
1897	H.R.H. The Duke of York, K.G.	126	83	3,705	7,285	24	11,223
1898	Earl Spencer, K.G.	121	79	3,687	7,182	25	11,094
1899	Earl of Coventry	116	75	3,656	7,009	23	10,879
1900	H.R.H. The Prince of Wales, K.G.	111	71	3,628	6,832	24	10,666
1901	Earl Cawdor	102	70	3,564	6,270	27	10,033
1902	H.R.H. Prince Christian, K.G.	100	69	3,500	5,955	26	9,650
1903	H.R.H. The Prince of Wales, K.G.	99	62	3,439	5,771	27	9,398
1904	Earl of Derby, K.G.	96	68	3,375	5,906	32	9,477
(Dec.) 1904	Lord Middleton	93	69	3,326	5,771	31	9,290

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Royal Agricultural Society of England.

INCORPORATED BY ROYAL CHARTER 26th MARCH, 1840.

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LORD MIDDLETON.

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The Society at present consists of about 9,300 Members.

All communications as to Membership or on the general business of the Society should be addressed to the Secretary at 13 Hanover Square, London, W.

ERNEST CLARKE,
Secretary.

13 HANOVER SQUARE, W.
February, 1905.

Telegraphic Address: "PRACTICE, LONDON." Telephone Number: "3675 GERARD."

General Privileges of Governors and Members.

FREE ADMISSION TO SHOWYARDS.

The Society holds every year an Exhibition of Live Stock, Farm Produce, and Implements, to which, and to the Grand Stands at the Horse Ring, Dairy, and elsewhere, Members are entitled to free admission.

REDUCED RATES FOR ENTRY OF LIVE STOCK AND IMPLEMENTS.

No entry fee is charged to Members exhibiting Implements at the Meetings. Firms and Companies may secure these privileges by the Membership of one or more of their partners. Entries of Horses, Cattle, Sheep, Pigs, Poultry, Produce, &c., can be made by Members at reduced rates.

SOCIETY'S JOURNAL AND OTHER PUBLICATIONS.

Every Member is entitled to receive, without charge, a copy of the Journal of the Society, each Volume of which contains articles and communications by leading authorities on the most important agricultural questions of the day, together with official reports by the Society's Scientific Advisers and on the various departments of the Annual Shows, and other interesting features.

Copies of the Journal may be obtained by Non-Members of the Publisher, MR. JOHN MURRAY, 50A Albemarle Street, W., at the price of twelve shillings per copy. Copies of the Society's pamphlets, sold at not less than One Shilling each, are obtainable by Members at half price on direct application to the Secretary.

LIBRARY AND READING ROOM.

The Society has a large and well-stocked library of standard books on agricultural subjects. A Reading Room is provided, at which the principal agricultural newspapers and other periodicals can be consulted by Members during office hours (10 a.m. to 4 p.m.; Saturdays, 10 a.m. to 2 p.m.).

CHEMICAL PRIVILEGES.

The Society makes annually a considerable grant from its general funds in order that Members may obtain at low rates analyses of feeding stuffs, fertilisers, soils, &c., by the Society's Consulting Chemist (Dr. J. AUGUSTUS VOELCKER, Analytical Laboratory, 22 Tudor Street, London, E.C.). Members may also consult Dr. VOELCKER either personally or by letter at a small fee.

VETERINARY PRIVILEGES.

Members can consult the Professors of the Royal Veterinary College at fixed rates of charge, and they have the privilege of sending Cattle, Sheep, and Pigs to the College Infirmary on the same terms as subscribers to the College.

BOTANICAL PRIVILEGES.

Reports can be obtained by Members from the Society's Consulting Botanist (Mr. W. CARRUTHERS, F.R.S., The Laboratory, 44 Central Hill, Norwood, S.E.) on the purity and germinating power of seeds, and on diseases or weeds affecting farm crops, at a fee of one shilling in each case.

ZOOLOGICAL PRIVILEGES.

Information respecting any animal (quadruped, bird, insect, worm, &c.) which, in any stage of its life, affects the farm or rural economy generally, with suggestions as to methods of prevention and remedy in respect to any such animal that may be injurious, can be obtained by Members from the Society's Zoologist (Mr. CECIL WARBURTON, M.A., The Zoological Laboratory, Cambridge) at a fee of one shilling in each case.

GENERAL MEETINGS OF MEMBERS.

Three General Meetings of Members take place annually: the Anniversary Meeting in London, on May 22; a Meeting in the Society's Showyard in the summer; and a Meeting in London in December—usually on the Thursday of the Smithfield Show week.

SPECIAL PRIVILEGES OF GOVERNORS.

In addition to the privileges of Members, as described above, Governors are entitled to an extra copy of each Volume of the Journal, to attend and speak at all meetings of the Council, and are alone eligible for election as President, Trustee, and Vice-President. The Annual Subscription of a Governor is £5, with a Life Composition of £50; and of a Member, £1, with a Life Composition of £15.

Governors' and Members' Privileges of Chemical Analysis.

(Applicable only to the case of persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis.)

THE Council have fixed the following rates of Charges for Chemical Analysis to Members of the Society.

These privileges are applicable only when the analyses are for *bona-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Land or estate agents, bailiffs, and others, when forwarding samples, are required to state the names of those Members on whose behalf they apply.

	£	s.	d.
1.—An opinion on the purity of any Fertiliser or Feeding Stuff (so far as this can be given without detailed analysis)	0	1	0
2.—Determination of any <i>one</i> constituent in a Fertiliser or Feeding Stuff	0	2	6
3.—Commercial analysis of any ordinary Fertiliser or Feeding Stuff	0	5	0
4.—Full Analysis of any compound Fertiliser or Feeding Stuff	0	10	0
5.—Analysis of any other material in ordinary use for agricultural purposes.	0	10	0
6.—Analysis of Milk, Cream, Butter, or other Dairy produce from Members' own farms	0	2	6
(N.B.—Samples in any way connected with the Sale of Food and Drugs Acts are not undertaken for analysis.)			
7.—Analysis of Water	1	10	0
8.—Analysis of Soil—determination of Lime only	0	10	0
9.—Analysis of Soil—partial	1	0	0
10.—Analysis of Soil—complete	3	0	0
11.—Consultation by letter or personal appointment	0	5	0

Together with the analysis will be given, as far as possible, an opinion as to whether an article analysed is worth the price asked for it, or not, provided the cost of the same, together with guarantee (if any), and other particulars relating to the purchase, be given at the time.

All samples and communications, together with fees for analysis, to be addressed to—Dr. VOELCKER, Analytical Laboratory, 22 Tudor Street, London, E.C.

A pamphlet containing Suggestions as to the Purchase of Fertilisers and Feeding Stuffs, and Instructions for selecting and forwarding Samples for Analysis, will be sent to any Member on application to the Secretary, from whom also may be obtained Forms of Order for Fertilisers and Feeding Stuffs.

Instructions for Selecting and Sending Samples for Analysis.

GENERAL RULES.—(1.) A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.—(2.) The sample should reach the Analyst *in the same condition* that it was in at the time when drawn.

When **Fertilisers** are delivered in hags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each hag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from $\frac{1}{2}$ lb. to 1 lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass hottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, subdivided, and, finally, samples should be taken as before, except that when the manure is coarse and hunky it is advisable to send larger samples than when it is in a finely divided condition.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken, three strips should be broken off right across the cake, and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up, and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed and three samples of about 1 lb. each should be taken and kept in tins or hags, duly marked, fastened and sealed as before. One of these lots should be sent for analysis, the remaining two being kept for reference. It is advisable also with the broken pieces to send a small strip from an unbroken cake.

Feeding Meals, Grain, &c.—Handfuls should be drawn from the centre of half a dozen different hags of the delivery; these lots should then be well mixed, and three $\frac{1}{2}$ -lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

Soils.—Have a wooden box made 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil, forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester hottles, holding half a gallon. One such hottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, &c., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS. Time for Taking Samples.—All samples, both of fertilisers and feeding stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding stuff is given to stock.

Procedure in the Event of the Vendor wishing Fresh Samples to be Drawn.—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and sealed by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

Suggestions to Purchasers of Fertilisers and Feeding Stuffs.

Purchasers are recommended in all cases to insist on having an **INVOICE**, and to see that such invoice contains the following particulars:—

In the case of **Fertilisers**:—

- (1) The name of the Fertiliser.
- (2) Whether the Fertiliser is artificially compounded or not.
- (3) The minimum analysis of the Fertiliser in respect of its principal fertilising ingredients.

In the case of artificially prepared **Feeding Stuffs** for Cattle:—

- (1) The name of the article.
- (2) The description of the article—whether it has been prepared (a) from one substance or seed, or (b) from more than one substance or seed.

For example:

- (a) An invoice describing an article as "Linseed Cake" implies a warranty that the article is pure, *i.e.*, is prepared from linseed only; "Cotton Cake" (whether decorticated or undecorticated), and "Rape Cake" (for feeding purposes), would come under a similar category.

Purchasers are reminded that the use of such terms as "95 per cent.," "Oil Cake," &c., affords no security against adulteration. The adoption of the ORDER FORM issued by the Society is therefore strongly recommended.

- (b) In the case of a Compound Cake or Feeding Stuff, a Vendor is only compelled by the Fertilisers and Feeding Stuffs Act of 1893 to state that it is prepared from more than one substance, and he is not required to specify the particular materials used in its preparation. Purchasers are recommended, therefore, to buy Mixed Feeding Cakes, Meals, &c., with a guaranteed analysis. Any statements in the invoice as to the component parts of such Mixed Cake or Meal will take effect as a warranty, as also will any statements in an invoice, circular, or advertisement as to the percentages of nutritive and other ingredients in any article sold for use as food for cattle.

Members of the Society are strongly recommended not only to see that the invoices given to them accurately describe the goods they have ordered, but to make all their orders subject to the *Analysis and Report of the Consulting Chemist of the Royal Agricultural Society of England*. Copies of a Form of Order for this purpose may be obtained on application to the Secretary.

Attention is particularly directed to the recommendations below as to the qualities of Fertilisers and Feeding Stuffs which purchasers should demand.

Conditions of Purchase and Sale.

FERTILISERS.

Raw Bones, Bone-meal, or Bone-dust to be guaranteed "PURE," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

Steamed or "Dagelatinised" Bones to be guaranteed "PURE," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Mineral Superphosphate of Lime to be guaranteed to contain a certain percentage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

Dissolved Bones to be guaranteed to be "made from raw bone and acid only," and to be sold as containing stated minimum percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

Compound Artificial Manures, Bone Manures, Bone Compounds, &c., to be sold by analysis stating the minimum percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

Basic Slag to be guaranteed to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch, and to contain a certain percentage of Phosphoric Acid or its equivalent in Phosphate of Lime. [The highest grades range from 17 to 20 per cent. of Phosphoric Acid; medium grades 14 to 16 per cent.: and low grades from 10 to 12 per cent. of Phosphoric Acid.]

Peruvian Guano to be described by that name, and to be sold by analysis stating the minimum percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed "PURE," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed "PURE," and to contain 95 per cent. of Nitrate of Soda.

Kainit to be guaranteed to contain 23 per cent. of Sulphate of Potash.

All Fertilisers to be delivered in good and suitable condition for sowing.

FEEDING STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, *i.e.*, prepared *only* from the one kind of seed from which their name is derived; and to be in sound condition. The Report of the Consulting Chemist of the Royal Agricultural Society of England to be conclusive as to the "purity" or otherwise of any feeding stuffs.

Mixed Feeding Cakes, Meals, &c., to be sold on a guaranteed analysis, to be sound in condition, and to contain nothing of an injurious nature, or ingredients that are worthless for feeding purposes.

Members' Botanical Privileges.

The Council have fixed the following rates of charge for the examination of Plants and Seeds by the Society's Consulting Botanist.

The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

- 1.—A report on the purity, amount, and nature of foreign materials, the perfectness and germinating power of a sample of seed . . . 1s.
- 2.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention . . . 1s.
- 3.—Report on any disease affecting farm crops . . . 1s.
- 4.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value . . . 5s.

N.B.—The Consulting Botanist's Reports on Seeds are furnished to enable Members—purchasers of seeds and corn for agricultural or horticultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes.

PURCHASE OF SEEDS.

The purchaser should obtain from the vendor, by invoice or other writing, the proper designation of the seeds he buys, with a guarantee of the percentage of purity and germination, and of its freedom from ergot, and, in the case of clover, from the seeds of dodder and broom-rape.

It is strongly recommended that the purchase of *prepared mixtures* of seeds should be avoided. The different seeds should be purchased separately and mixed by the farmer. Mixtures cannot be tested for germination.

Copies of an "Order Form and Conditions of Purchase and Sale of Seeds" may be obtained by Members on application to the Secretary, at 13 Hanover Square, London, W.

THE SAMPLING OF SEEDS.

The utmost care should be taken to secure a fair and honest sample. This should be drawn from the bulk delivered to the purchaser, and not from the sample sent by the vendor.

When legal evidence is required, the sample should be taken from the bulk, and placed in a sealed bag in the presence of a witness. Care should be taken that the sample and bulk be not tampered with after delivery, or mixed or brought in contact with any other sample or bulk.

At least one ounce of grass and other small seeds should be sent, and two ounces of cereals and the larger seeds. When the bulk is obviously impure, the sample should be at least double the amount specified. Grass seeds should be sent at least four weeks, and seeds of clover and cereals two weeks before they are to be used.

The exact name under which the sample has been sold and purchased should accompany it.

Members' Botanical Privileges—*continued.*

REPORTING THE RESULTS.

The Report will be made on a schedule in which the nature and amount of impurities will be stated, and the number of days each sample has been under test, with the percentage of the seeds which have germinated.

"Hard" clover seeds, though not germinating within the time stated, will be considered good seeds, and their percentage separately stated.

The impurities in the sample, including the chaff of the species tested, will be specified in the schedule, and only the percentage of the pure seed of that species will be reported upon; but the REAL VALUE of the sample will be stated. The Real Value is the combined percentages of purity and germination, and is obtained by multiplying these percentages and dividing by 100; thus in a sample of Meadow Fescue having 88 per cent. purity and 95 per cent. germination, 88 multiplied by 95 gives 8,360, and this divided by 100 gives 83·6, the Real Value.

SELECTING SPECIMENS OF PLANTS.

When a specimen is sent for determination, the whole plant should be taken up and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

Parcels or letters containing seeds or plants for examination (carriage or postage prepaid) must be addressed to Mr. W. CARRUTHERS, F.R.S., The Laboratory, 44 Central Hill, Norwood, London, S.E.

Members' Zoological Privileges.

The Council have fixed the charge of 1s. for information respecting any animal (quadruped, bird, insect, worm, &c.) which, in any stage of its life affects the farm or rural economy generally, with suggestions as to methods of prevention and remedy in respect to any such animal which may be injurious.

In inquiries concerning injuries, specimens of the injury done should accompany the animal supposed to cause it.

All specimens should be sent in tin or wooden boxes, or in quills, so as to prevent injury in transmission, and must be accompanied by the prescribed fees.

Parcels or letters containing specimens (carriage or postage paid) must be addressed to Mr. CECIL WARBURTON, M.A., Zoological Laboratory, Cambridge.

Members' Veterinary Privileges.

I.—ADMISSION OF SICK OR DISEASED ANIMALS TO THE ROYAL VETERINARY COLLEGE.

1. Members of the Society have all the privileges of subscribers to the Royal Veterinary College, Camden Town, N.W., so far as the admission for treatment of Cattle, Sheep, and Swine is concerned, without being called upon to pay the annual subscription to the College of two guineas. The charges made by the College for keep and treatment are as follows:—Cattle, 10s. 6d., and Sheep and Pigs, 3s. 6d. per week for each animal.

2. The full privileges of subscribers, including the examination of horses, and the admission of horses and dogs into the College Infirmary for surgical or medical treatment, on payment of the cost of keep, will be accorded to Members of the Society on payment of a subscription to the College of one guinea instead of two guineas per annum.

II.—FEES FOR CONSULTATIONS, ANALYSES, AND EXAMINATIONS AT THE ROYAL VETERINARY COLLEGE.

The following fees are payable by Members of the Society for services performed at the Royal Veterinary College on their behalf in cases where a visit to the locality is not involved:—

	£	s.	d.
Personal consultation with a Veterinary Professor	0	10	6
Consultation by letter	0	10	6
Post-mortem examination of an animal, and report thereon	1	1	0
Chemical Examination of viscera for any specified metallic poison	0	10	6
Chemical Examination of viscera for metallic poisons	1	0	0
Chemical Examination of viscera for vegetable poisons	1	0	0
Chemical Examination of viscera complete, for metals and alkaloids	2	0	0

(The above fees do not apply to cases which involve a visit to the locality.)

III.—INVESTIGATION OF OUTBREAKS OF DISEASE AMONG FARM STOCK.

1. In the event of an outbreak of disease among Cattle, Sheep, or Swine occurring on the farm of any Member of the Society, application should at once be made to the Principal of the Royal Veterinary College, Camden Town, London, N.W.

2. The Principal will then instruct an officer of the College to inquire into the outbreak and report to him. He will also fix the amount of remuneration to be paid to the Inspector, whose professional fee will in no case exceed two guineas per day, exclusive of the actual cost of travelling and maintenance.

3. When it appears on the report of the Inspector selected that the outbreak was of an important character, or of general interest, the cost of the investigation will be defrayed by the Royal Veterinary College.

4. An annual grant is made by the Society to the Royal Veterinary College in aid of the further development of Cattle Pathology. In order to assist the authorities of the College in making the necessary investigations, Members of the Society are particularly requested to send to the College any diseased animals (cattle, sheep, or swine) which they would otherwise destroy as useless, and also any specimens of diseased parts of an unusual character. In the event of living animals being sent, it will be necessary to telegraph to the College at Camden Town the time of their arrival at a London station, so that a van may be sent to meet them. The expense of transit will be defrayed by the Royal Veterinary College.

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All interested in the subject of laying down land to Grass should read

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The Times says :—

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"Mr. M. J. Sutton's valuable book, which, since it was first published some sixteen years ago, has rightly been regarded as the standard work on the subject of grass lands, requires no introduction at this time of day ; but well-known as the volume is, the intimation that a sixth edition has been called for and supplied will be received with interest and satisfaction."

Sixth Edition. Price 5s., bound in cloth.

Completely revised, and containing a chapter on Weeds found in Pastures. An Index has also been added. Substantially bound in cloth. Illustrated with 23 varieties of Natural Grasses, Clovers, &c., and containing 46 Analyses of Grasses, Clovers, &c., prepared expressly for this work by Dr. J. Augustus Voelker.

A few copies of the Edition de Luxe at 21s., with the original coloured plates, can still be supplied by the publishers,

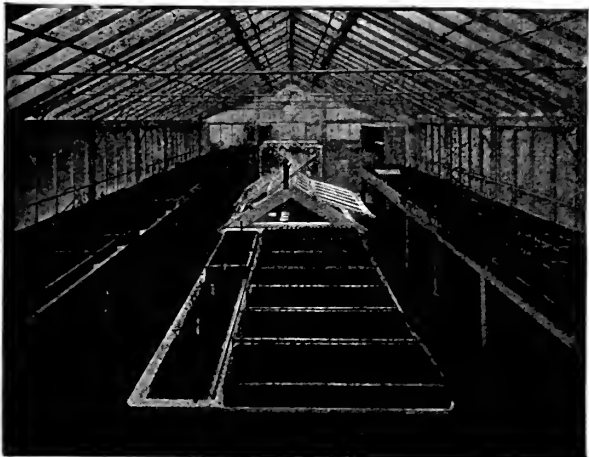
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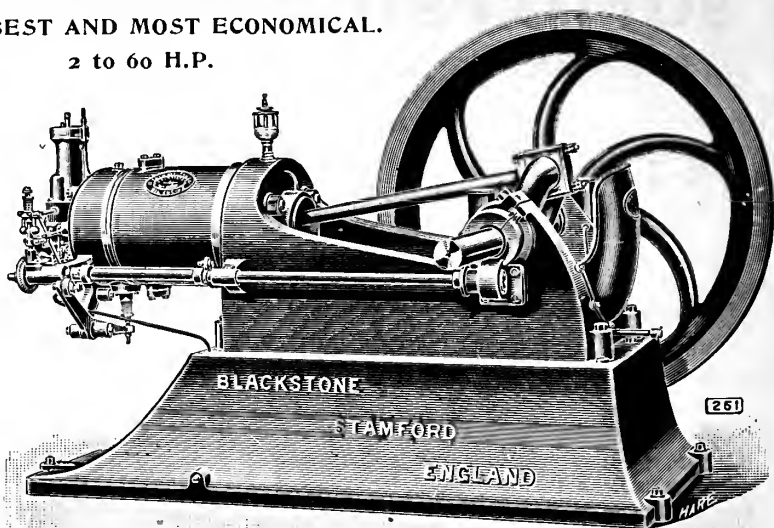


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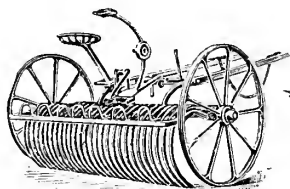
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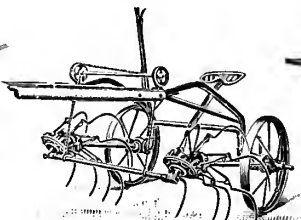
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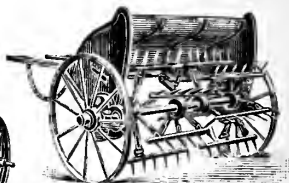
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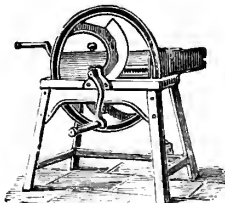


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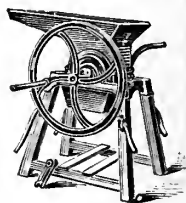
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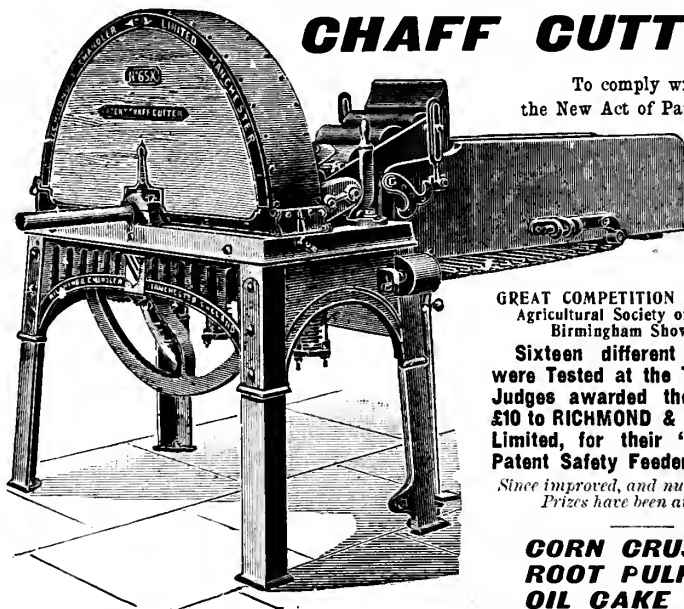
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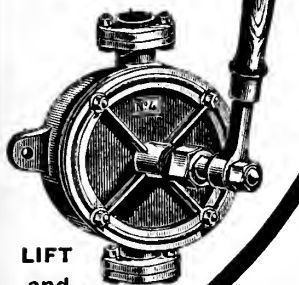
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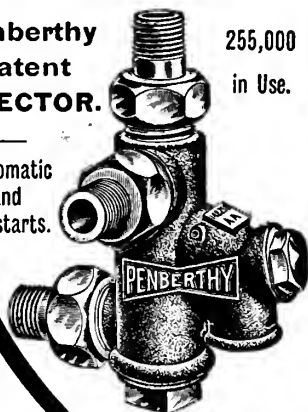
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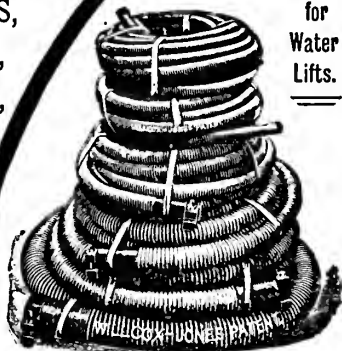
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NORMOOR VICTOR 18987 by Prince Harold 14228, dam 17282 Rocks Bracelet by Albert Victor II. 10859, grand-dam 3892 Bracelet by William the Conqueror 2343. Normoor Victor 18987 won in 1901—First Prize at Kingston, First Prize at Hay, First at Monmouth, Second Hereford; 1902—Second Cambridgeshire. His dam, Rocks Bracelet, won many prizes.

ADMIRAL DEWEY (Vol. 26), Bay, foaled 1901, sire Dewey II. 17937, dam Everton Kathleen 21768, by Nailstone Rising Star 14754, grand-dam Bute by Better Times 2984.

BIRDSALL MEDALIST (Vol. 23), Bay, foaled 1901, sire Menestrel 14180, dam 15814 Tom's Darling by Honest Tom 5123, grand-dam Dapper by Farmer's Glory 869. Tom's Darling is the grand-dam of the Champion Stallion Birdsall Menestrel.

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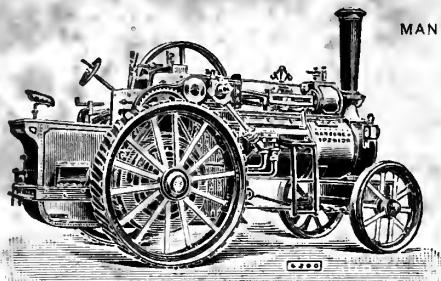
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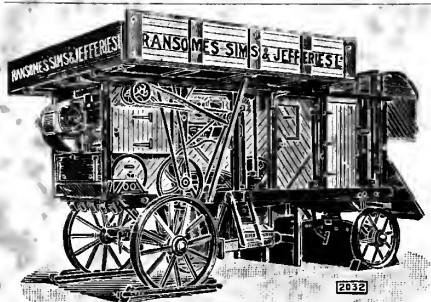
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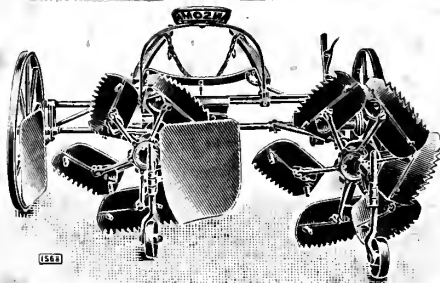
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